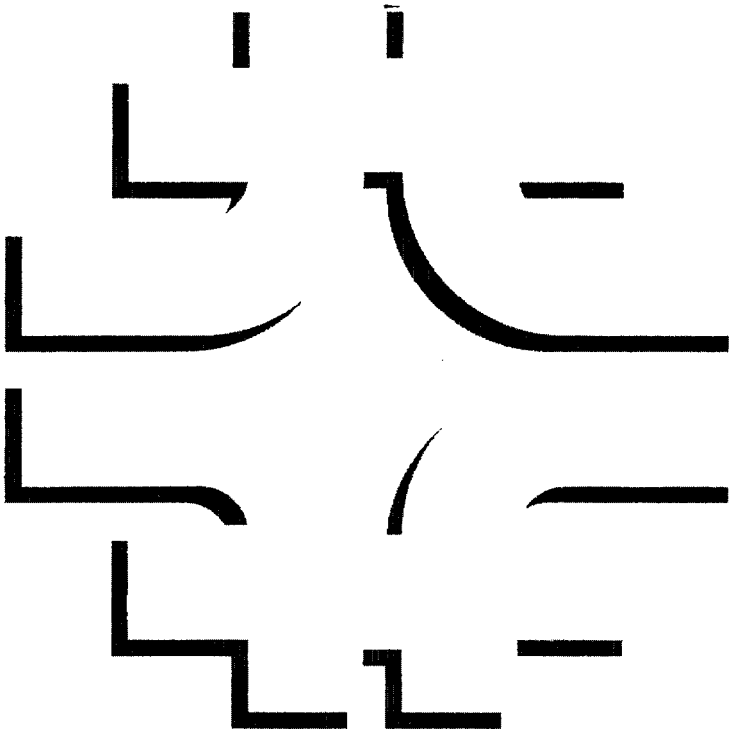
2001 Fermilab Research Program Workbook



Fermilab Research Program 2001

Workbook

March 2001

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Batavia, Illinois

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INTRODUCTION

Here is the 2001 edition of the venerable (over a quarter century old) Fermilab Research Program Workbook. While its original purpose may be known only to a few Fermilab veterans, it provides a yearly update on the Laboratory's program and related facilities, together with statistics on Fermilab's users.

As for the past many Workbooks, thanks are due to Jud Parker for the care and feeding of the databases on which much of the information is based; Taiji Yamanouchi for sage advice and encouragement; and Jackie Coleman, who makes all of the parts into a Workbook.

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SECTION I. STATISTICS ON FERMILAB PROPOSALS

The status of Fermilab proposals is summarized in this Section of the Workbook. All proposals are classified into one of the following categories:

	Categories	Definitions
Approved Proposals	Completed	Approved proposals that have completed data-taking.
	Remaining	Approved proposals either running or waiting for data-taking.
	Inactive	Approved proposals which are now unlikely to ever be completed.
Pending Proposals	Unconsidered	Relatively new proposals awaiting consideration
	Deferred	Proposals for which consideration has been postponed for a specific reason
	"Not Approved"	Proposals for which a conventional decision cannot be made.
Obsolete Proposals	Rejected	Proposals rejected from further consideration
	Withdrawn/Inactive	Proposals that were not considered at the request of the spokesperson or that are no longer being considered for other reasons.

At the present time, 919 proposals have been received. Table 1 and Figure 1 show the number of proposals in each category each year since 1970.

TABLE 1. STATUS OF PROPOSALS AT FERMILAB

	Aug 1970	Jul 1971	Jul 1972	Jul 1973	Jul 1974	Jul 1975	Jul 1976	Jul 1977	Jul 1978	Jul 1979	Jul 1980	Jul 1981	Jul 1982	Jul 1983	Jul 1984	Jul 1985	Jul 1986	Jul 1987	Jul 1988	Jul 1989	Jul 1990	Jul 1991	Jul 1992	Jul 1993	Jul 1994	Jul 1995	Jul 1996	Jul 1997	Jul 1998	Jul 1999	Jul 2000	Mar 2001
APPROVED PROPOSALS																															
Completed and Data Analysis	0	0	0	16	57	97	152	190	234	248	264	278	295	297	300	310	324	326	339	341	348	355	383	389	389	389	396	396	403	405	412	415
Remaining and Inactive	21	53	70	75	89	121	100	82	57	52	41	41	29	33	43	48	39	42	34	43	38	34	20	24	28	30	25	34	30	32	31	31
Subtotals	21	53	70	91	146	218	252	272	291	300	305	319	324	330	343	358	363	368	373	384	386	389	403	413	417	419	421	430	433	437	443	446
PENDING PROPOSALS																															
Unconsidered	23	16	19	10	0	2	6	12	6	6	13	27	16	25	11	8	8	13	13	11	21	50	36	17	6	8	9	11	11	15	7	5
Deferred	29	35	39	43	54	45	25	24	11	2	10	7	9	11	2	0	1	0	0	0	0	0	2	3	1	1	0	0	0	0	1	1
"Not Approved"	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Subtotals	52	51	58	53	54	47	31	36	17	8	23	34	26	37	14	9	10	14	14	12	22	51	39	21	8	10	10	12	12	16	9	7
OBSOLETE PROPOSALS																															
Rejected	8	15	20	42	65	85	135	166	185	189	191	210	221	229	231	234	236	237	239	241	242	243	245	247	251	250	250	250	251	251	255	256
Withdrawn/Inactive	1	33	35	47	61	71	80	93	114	127	131	139	147	149	159	163	166	168	169	168	169	170	173	191	196	198	201	202	206	209	210	210
Subtotals	9	48	55	89	126	156	215	259	299	316	322	349	368	378	390	397	402	405	408	409	411	413	418	438	447	448	451	452	457	460	465	466
TOTAL NUMBER OF PROPOSALS	82	152	183	233	326	421	498	567	607	624	650	702	718	745	747	764	775	787	795	805	819	853	860	872	872	877	882	894	902	913	917	919

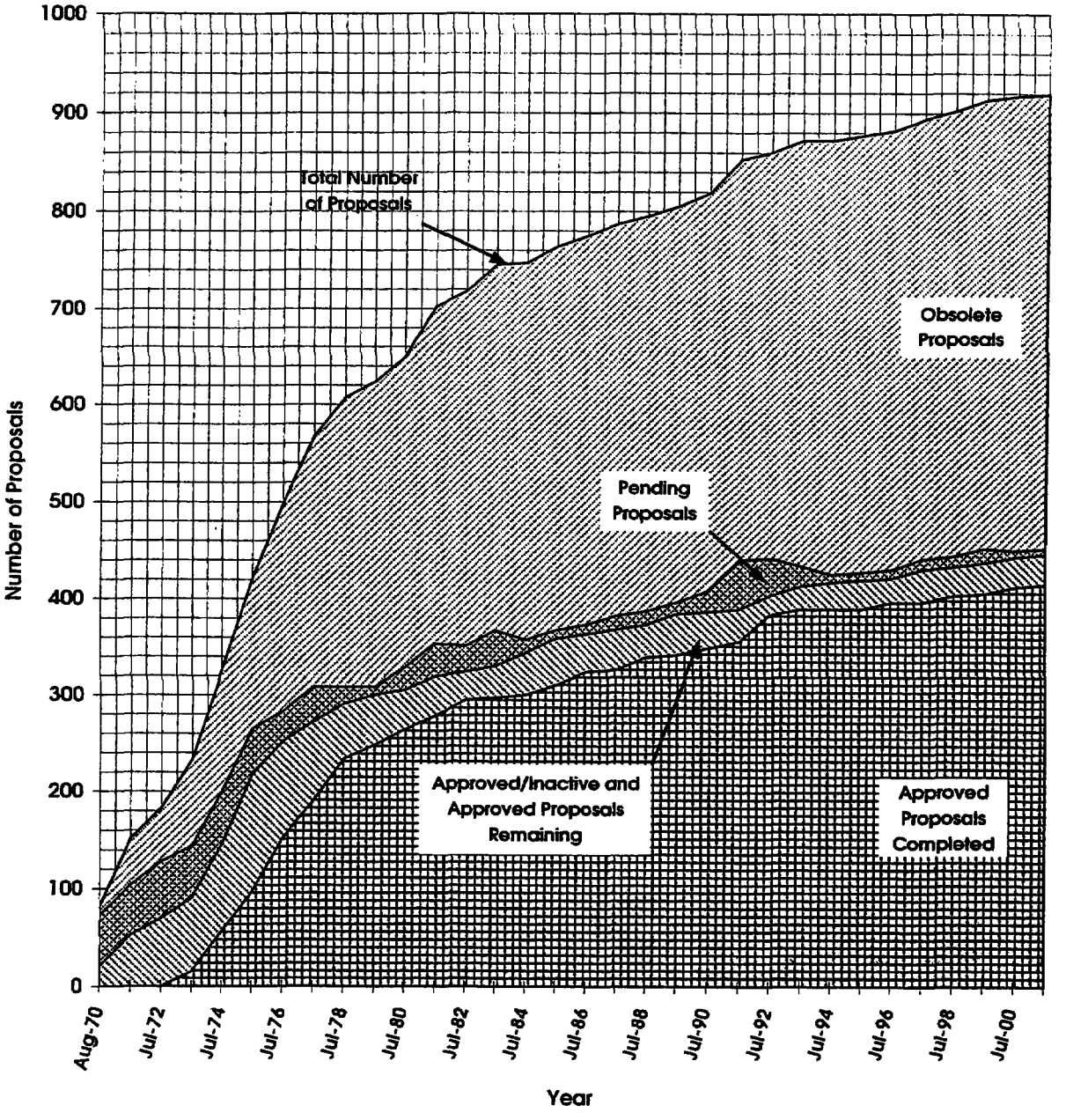


Figure 1. Growth of the Fermilab research program. The total number of approved experiments is obtained by adding the numbers shown as completed and those remaining and approved/inactive. Pending proposals are those which are unconsidered, deferred or "not approved;" obsolete proposals are rejected or withdrawn/inactive. Note that in this figure "Approved Proposals Completed" includes experiments still analyzing data.

SECTION II. ACCELERATOR PERFORMANCE

This Section gives summaries of Tevatron operation for the Collider runs (900 GeV × 900 GeV) of 1992-1993 and 1994-1996, and also the 800 GeV Fixed Target runs of 1996-1997 and 1999-2000. The 1999-2000 Fixed Target run was the first after the Main Injector replaced Fermilab's venerable Main Ring accelerator.

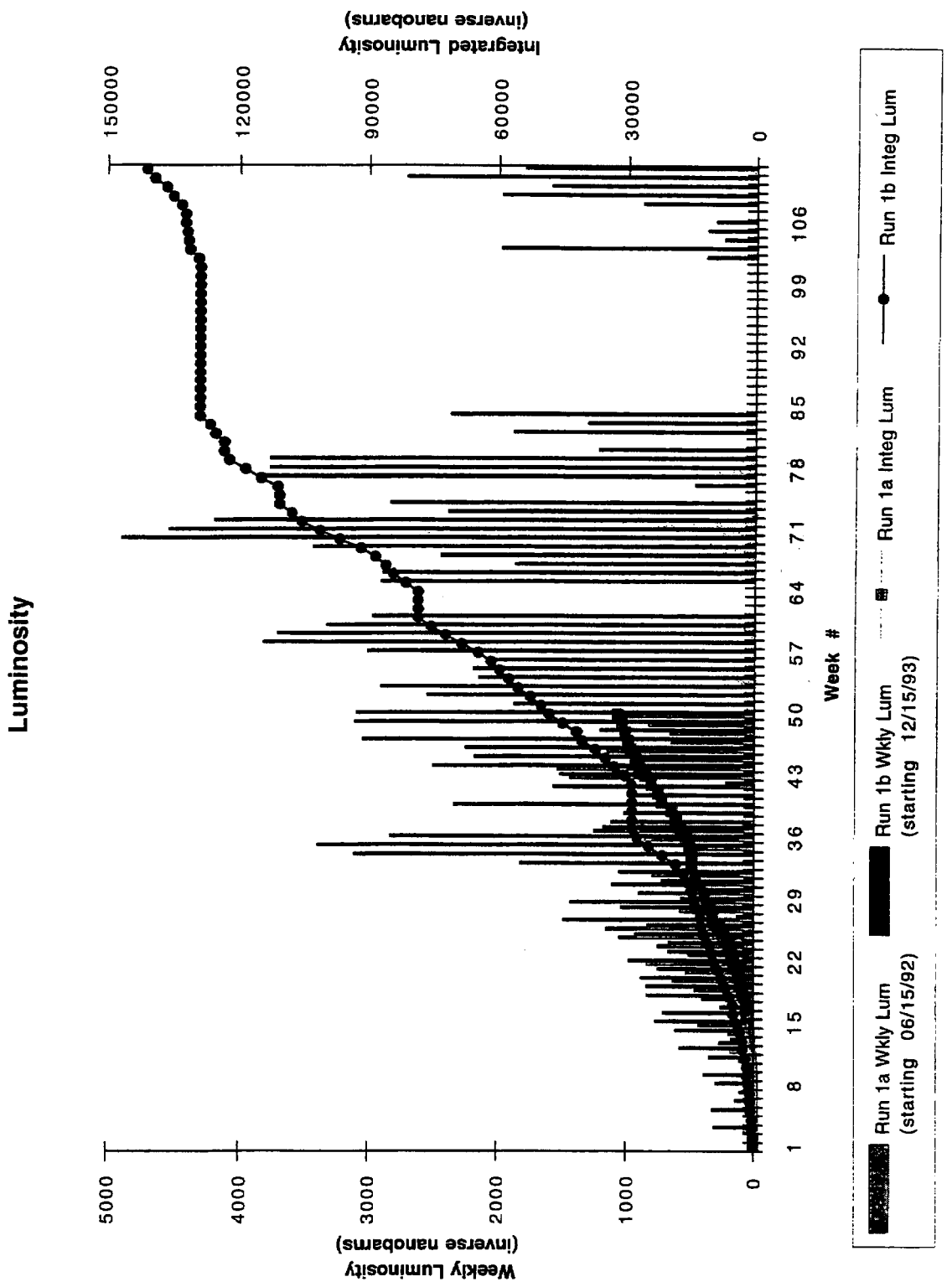


Figure 2. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - luminosity per week and integrated luminosity.

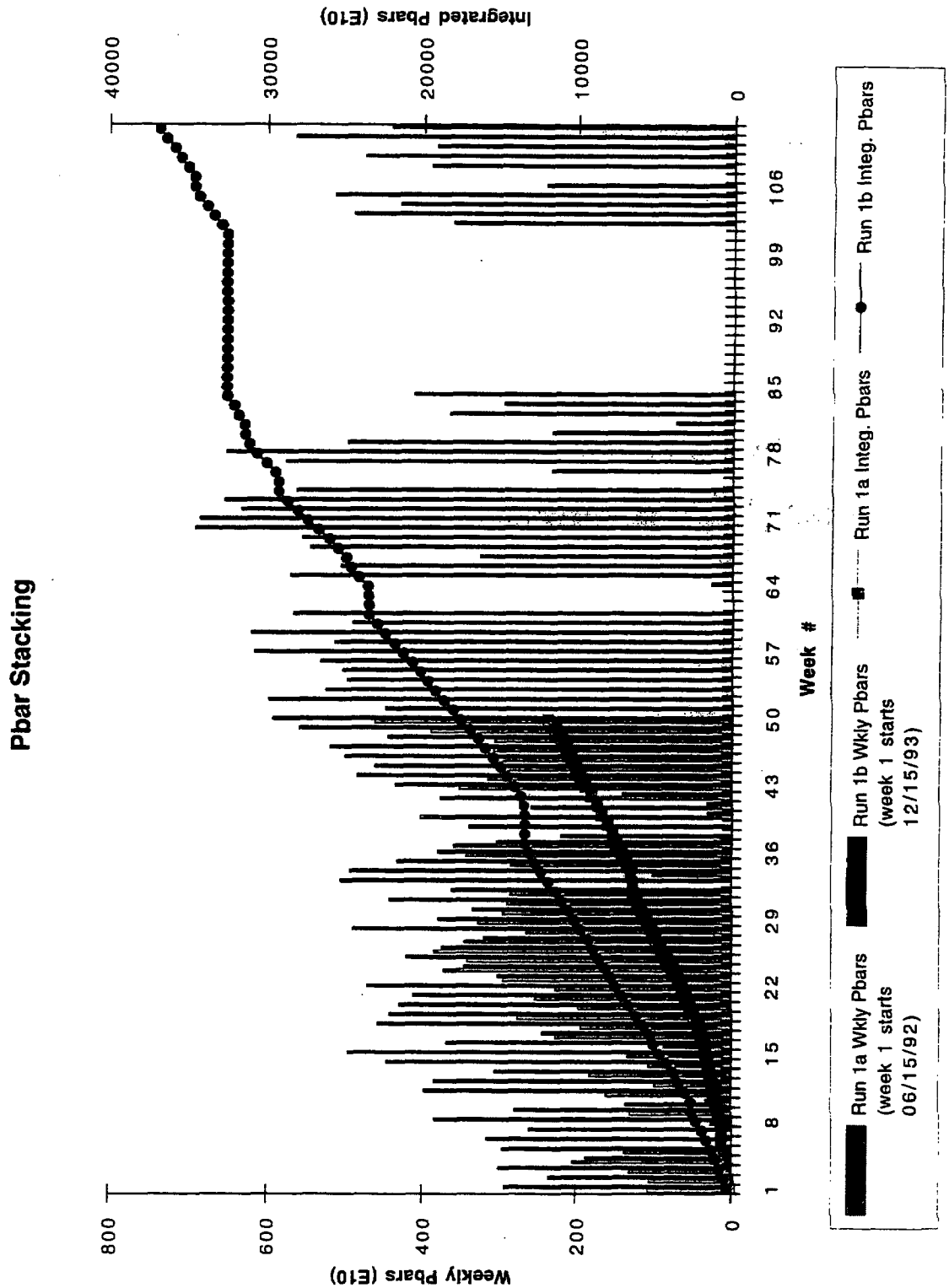


Figure 3. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - antiproton stacking per week and integrated stacking.

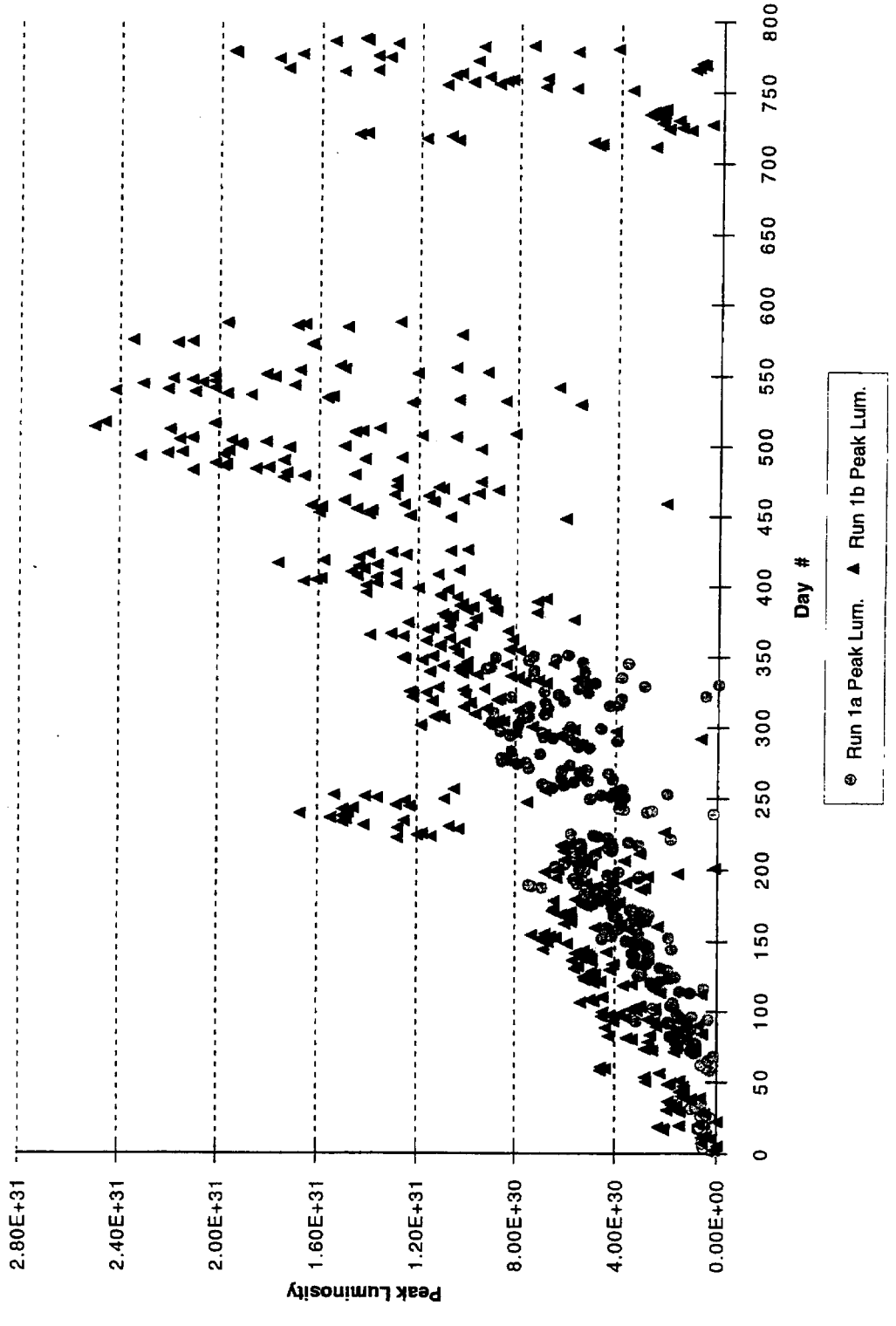


Figure 4. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - daily peak luminosity.

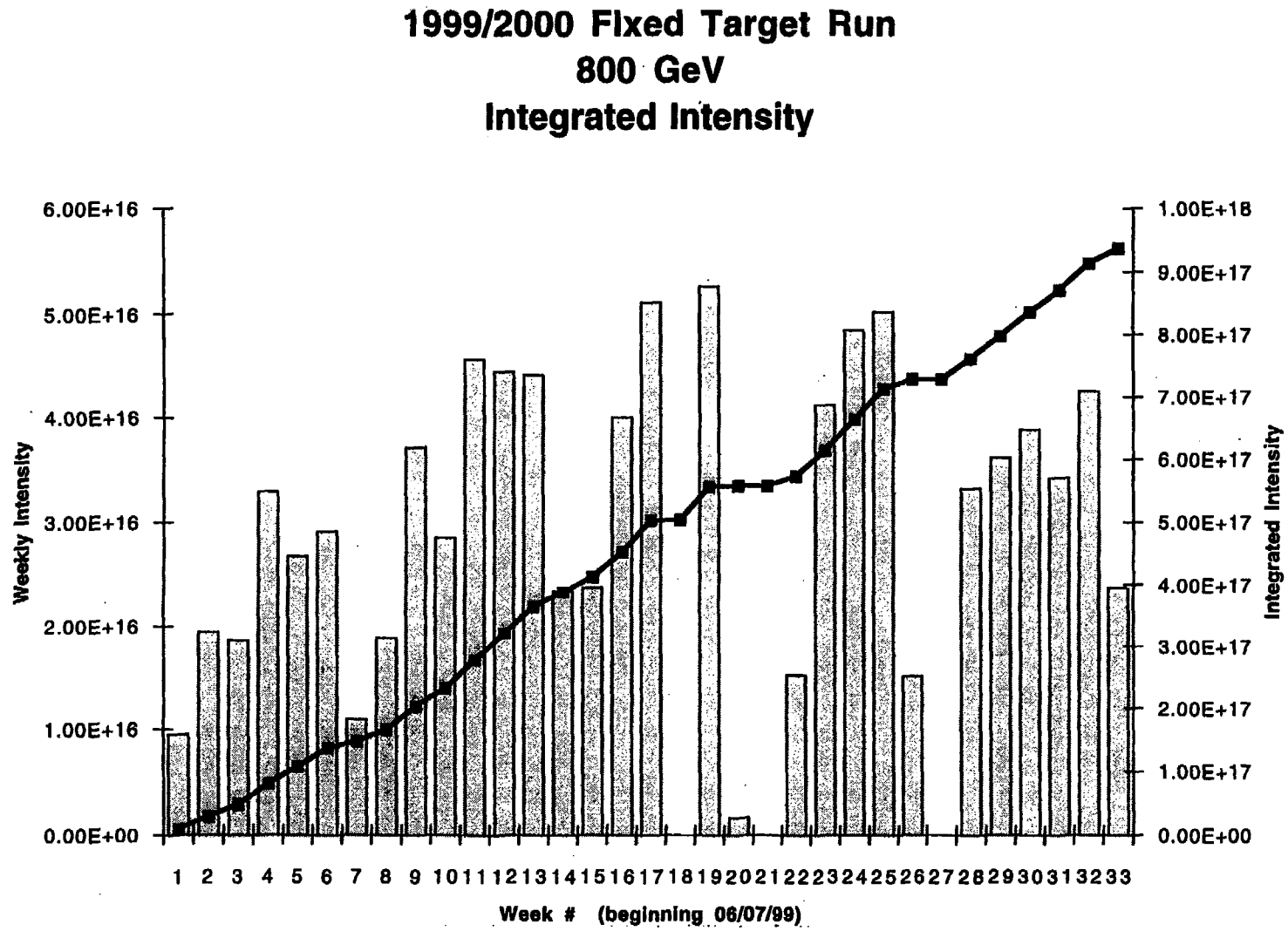


Figure 5. Integrated and weekly intensity for the 1999-2000 Fixed Target running period. Note that the intensities were set by the needs of the experimental program.

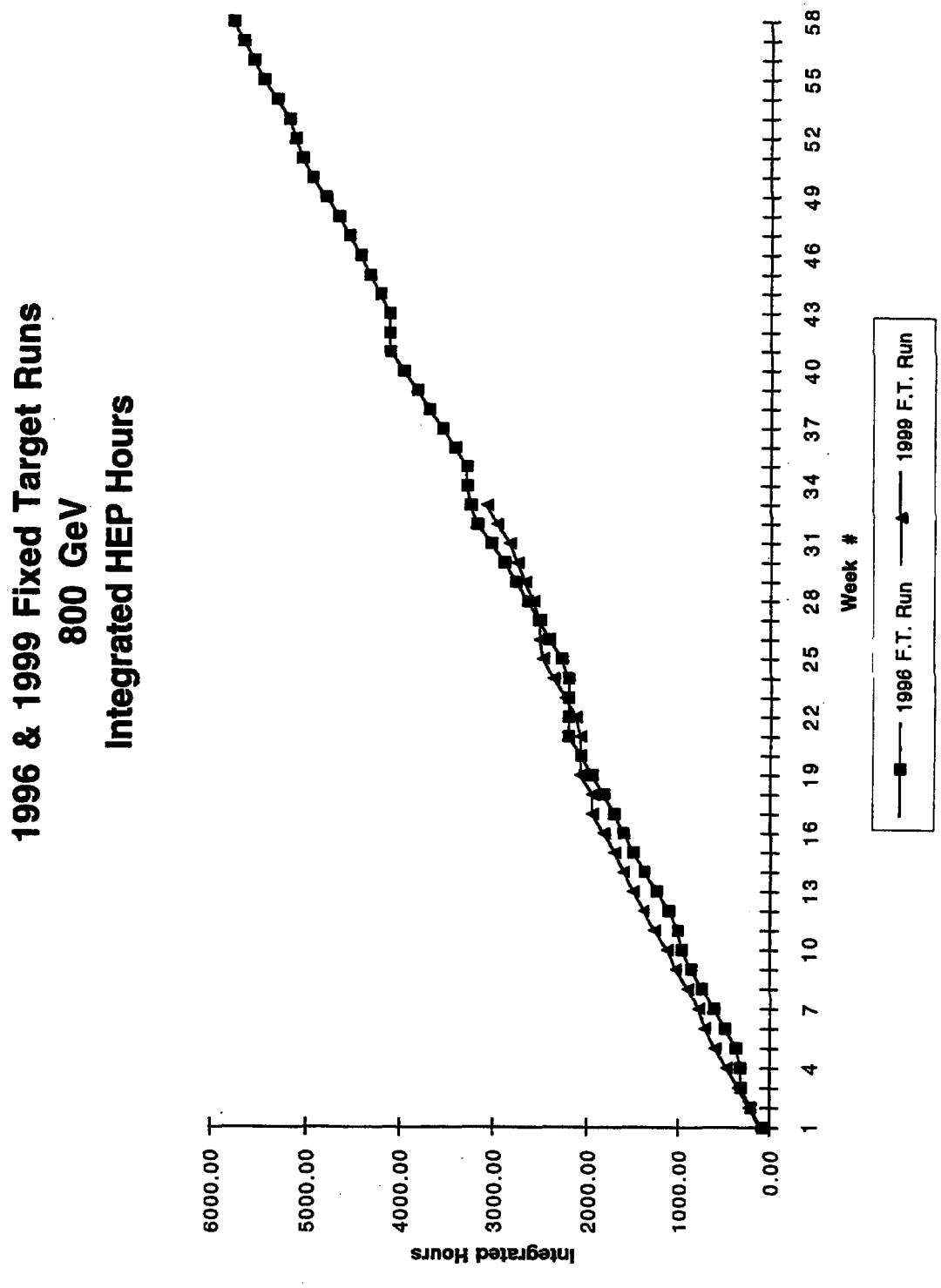


Figure 6. Integrated high energy physics hours for the 1996-1997 and 1999-2000 Fixed Target running period.

SECTION III. FERMILAB BEAM PROPERTIES AND EXPERIMENT LOCATION

In early 2000, the final currently scheduled 800 GeV Fixed Target run ended, with two major experiments (E-799/832 and E-871) taking data, and a test beam also in use. Properties of the beamlines which were used are listed in Table 2. The locations of all Fermilab fixed-target area beamlines are shown in Figure 7, while the locations of the E-799/832 and E-871 experiments are shown in Figure 8. The charmonium production experiment E-835 took data in the Accumulator. Figure 9 gives the locations of Collider and Accumulator experiments.

The currently approved fixed-target experiments will use beams from the Booster (for the neutrino experiment E-898, MiniBooNE) and the Main Injector (for the neutrino experiment E-875, MINOS). The locations of these experiments are shown on the overall Fermilab accelerator layout in Figure 10, and their expected beam fluxes are shown in Figures 11 and 12. Table 3 gives the number of 120 GeV Main Injector protons/hour that can be expected under various operating scenarios, and Figures 13 and 14 show some expected secondary beam fluxes using the Main Injector.

TABLE 2. FERMILAB BEAM LINE PROPERTIES

Beam	Momentum Range (GeV/c)	±Δ p/p (%)	Production Angle (mr)	Solid Angle (μsr)	Particles	Flux per 10^{12} protons on target	at (GeV/c)	Comments
MC	150 (mean)	75-200 GeV	0 to ± 3.0	4.88	π^-, Σ^-, Ξ^-, Ω^-, π^+, p, Σ^+, $\bar{\Xi}^+$, $\bar{\Omega}^+$	4.3×10^9	150	Positive and negative secondary beams will use different targets
NM	85 (mean)		4.0 - 5.8	0.25	K_L^0, n	$\approx 2 \times 10^7$ $\approx 4 \times 10^7$		Neutral beam with 800 GeV primary protons
MT	60 - 180	1%	0		π^+	1×10^7	120	Predicted values

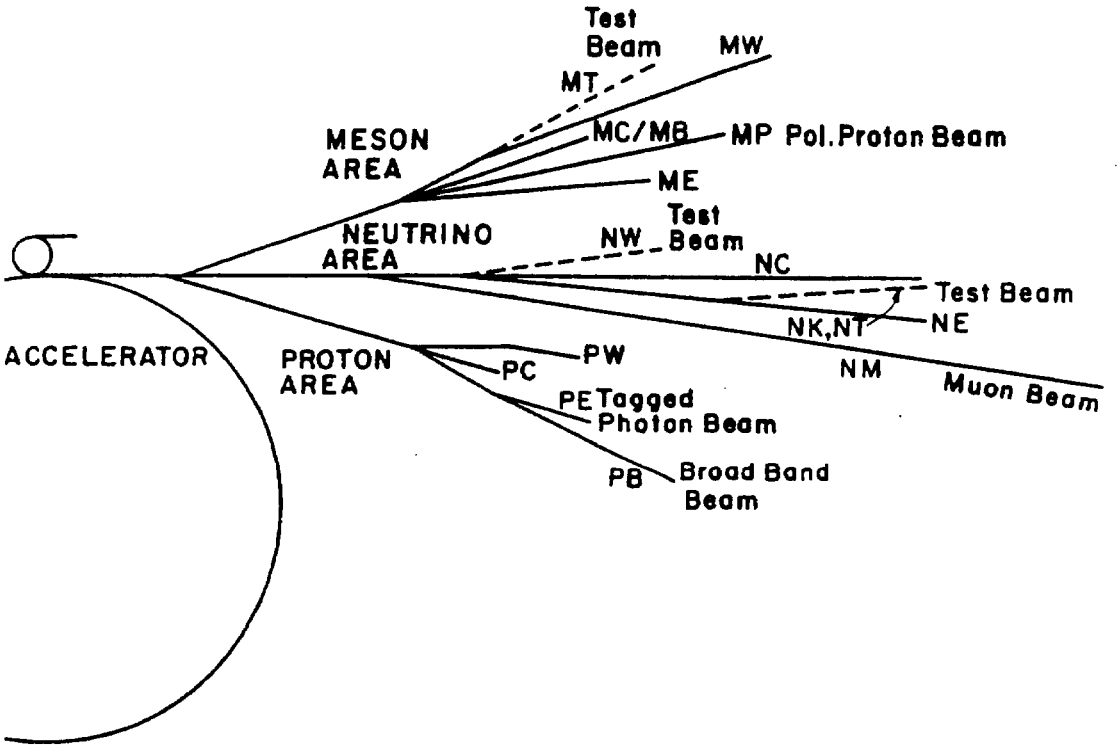


Figure 7. Layout of Fermilab Fixed Target area beams.

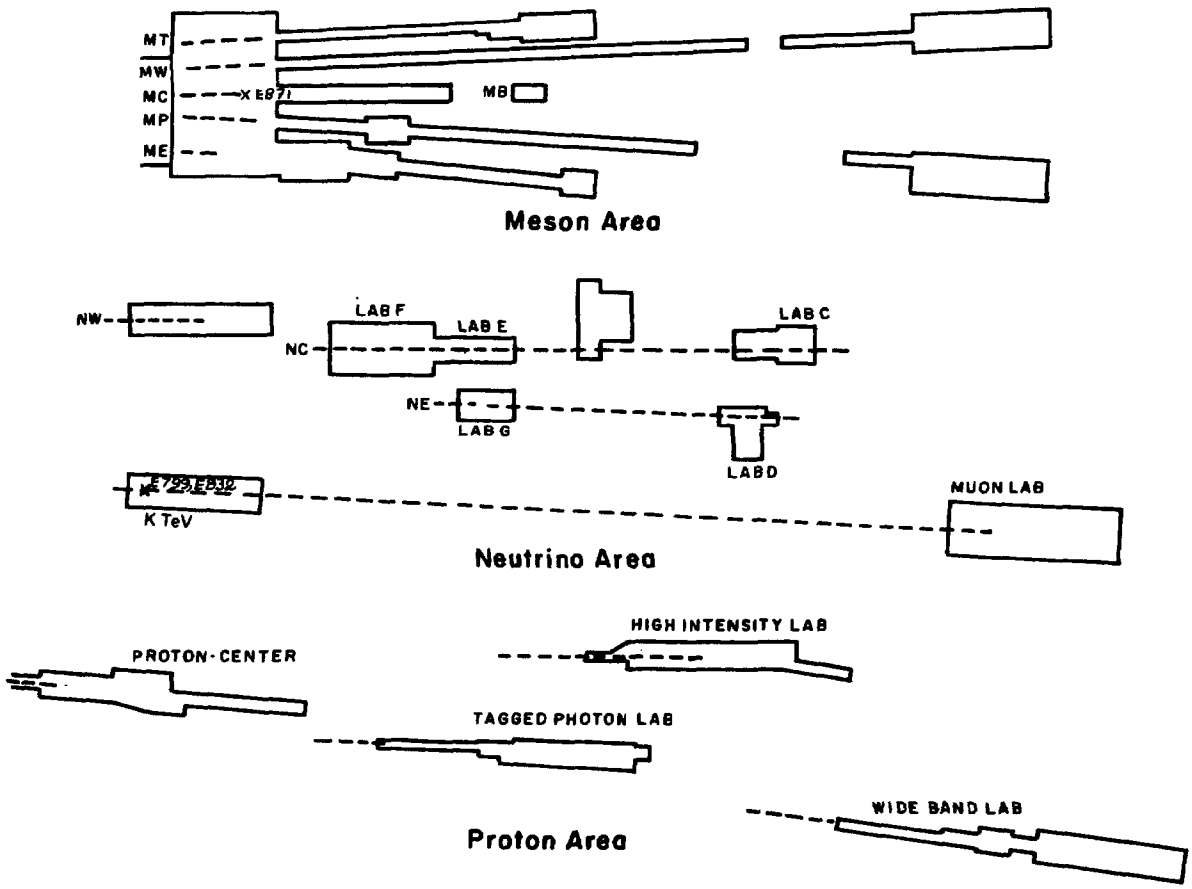


Figure 8. Schematic of the Fixed Target experimental areas with locations of the major experiments which ran in the 1999-2000 800 GeV Fixed Target run. The drawings are not to scale.

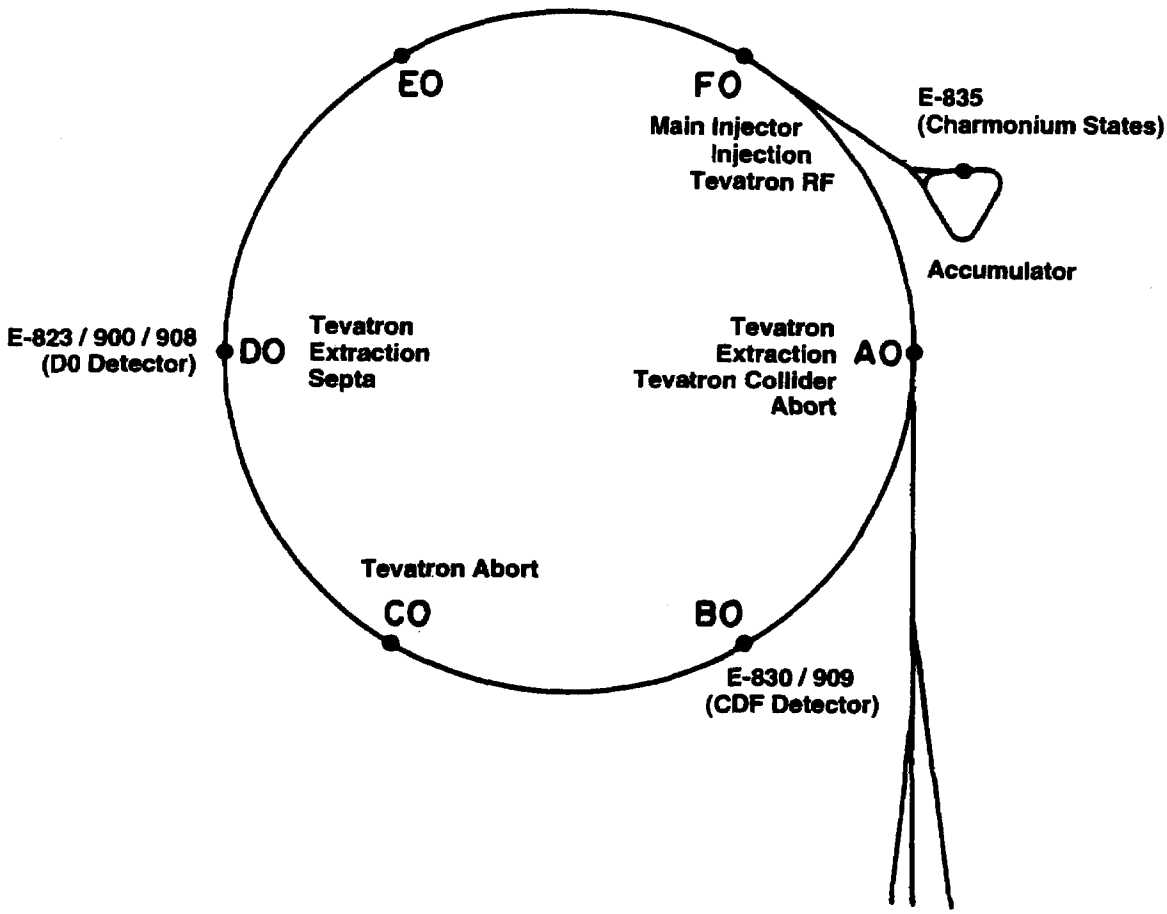


Figure 9. Locations in the Tevatron of the approved $p\bar{p}$ Collider experiments and the charmonium production experiment which uses the Antiproton Accumulator.

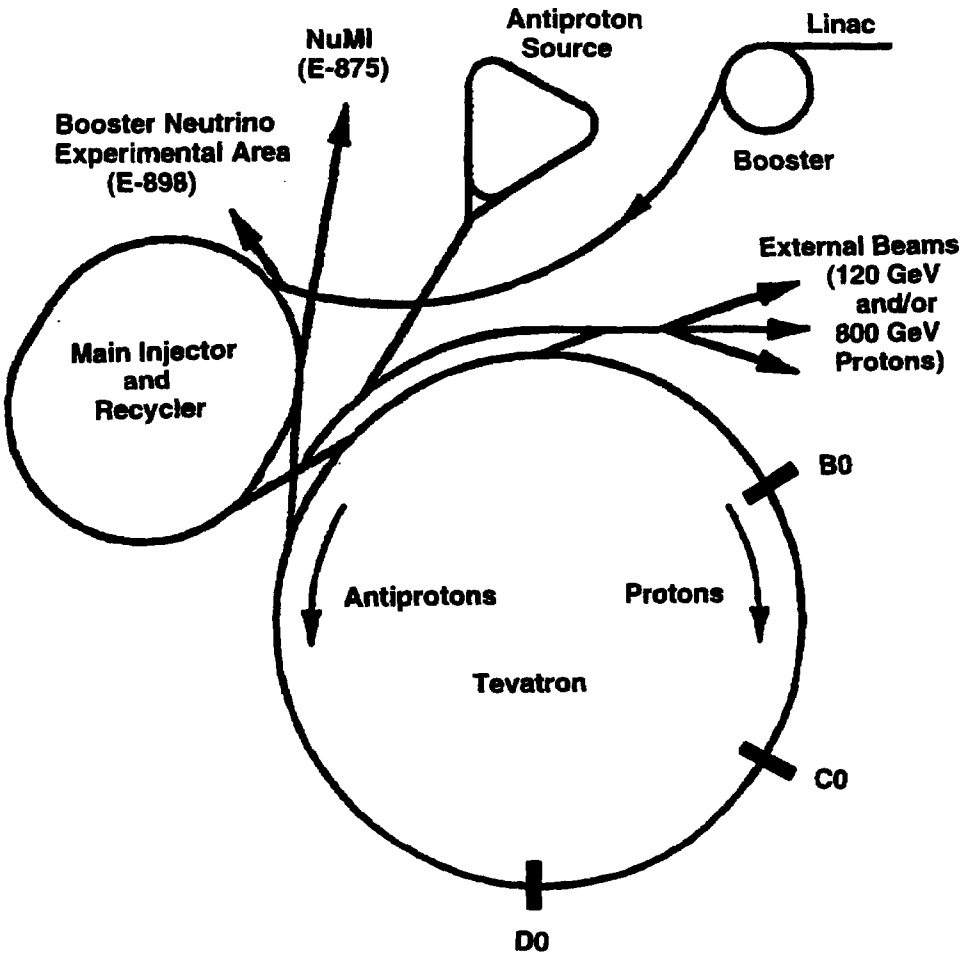


Figure 10. Schematic layout of Fermilab accelerators with present and future experimental areas.

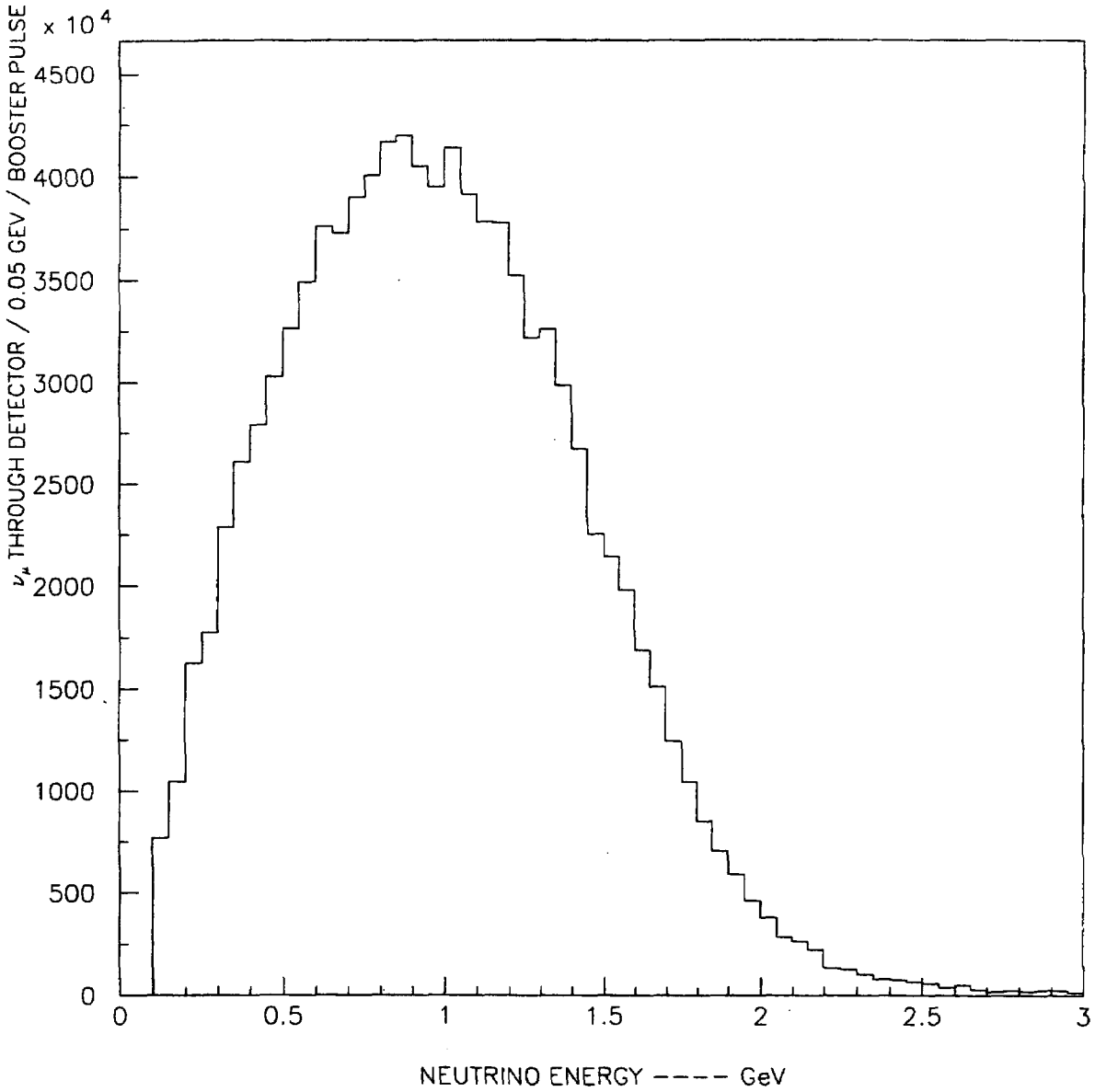


Figure 11. **Predicted neutrino flux through the MiniBooNE detector. This is produced by the 8 GeV Booster beam at 5×10^{12} protons per pulse on a beryllium target, with a single focusing magnetic horn and a 50 meter long, 2 meter diameter decay pipe.**

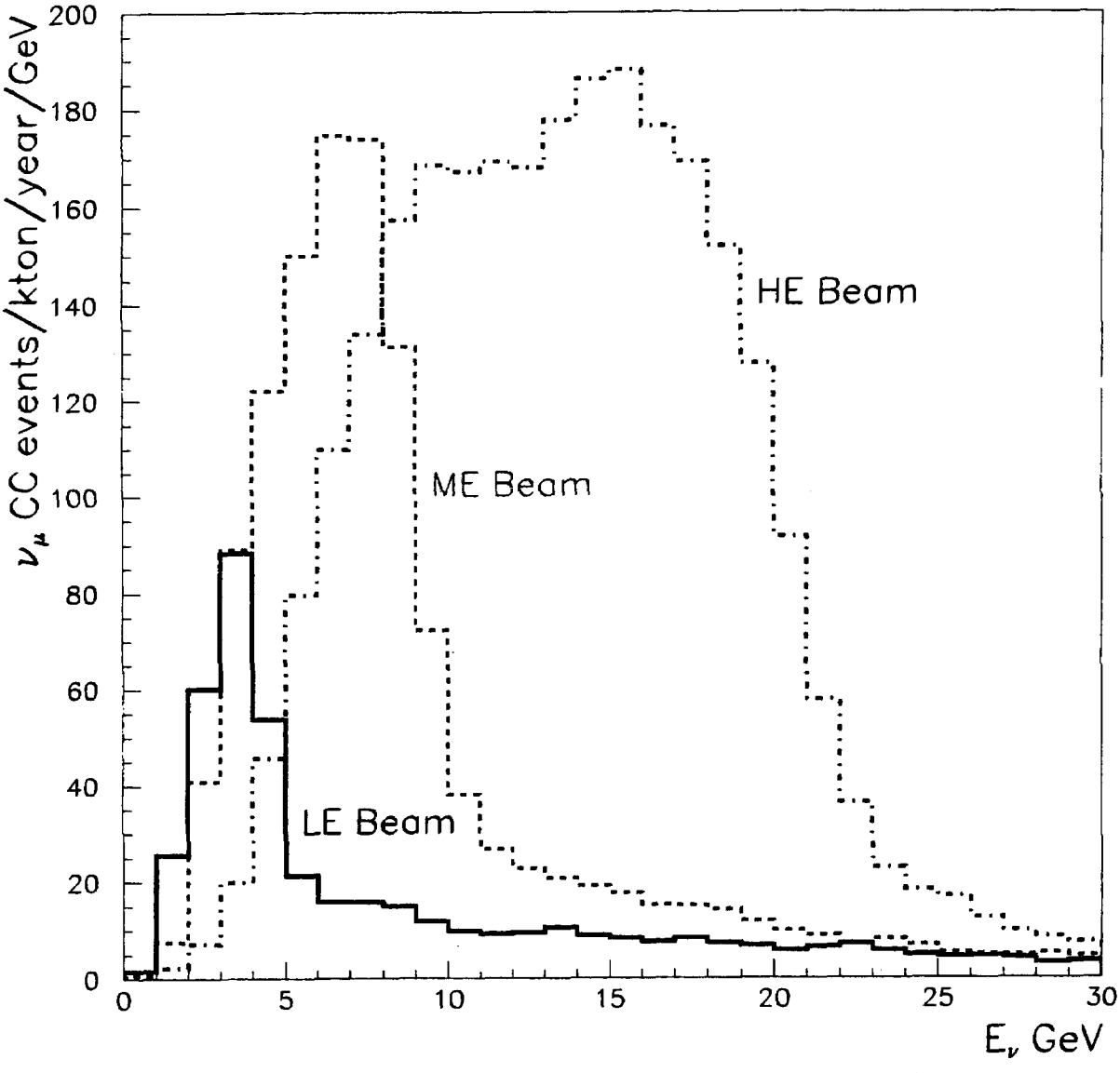


Figure 12. Neutrino event rate at Soudan, MN. Three beam tunes are shown; the most desirable tune depends on what the neutrino masses actually turn out to be. NuMI plans to begin operations with the LE tune. Rates are based on 3.7×10^{20} protons per year from the Main Injector; the MINOS detector mass will be 5.4 kilotons.

TABLE 3. PROTONS PER HOUR UNDER VARIOUS MODES OF OPERATION

Mode	Cycle Time	Protons/Hour		
		AP Target	Fast Spill	Slow Spill
Antiproton Production	1.466 sec	1.2×10^{16}	--	--
Fast Spill	1.866	--	5.8×10^{16}	--
Slow Spill	2.866	--	--	3.8×10^{16}
Mixed: AP+Fast Spill	2.000	0.9×10^{16}	4.5×10^{16}	--
Mixed: AP+Slow Spill	3.000	0.6×10^{16}	--	3.0×10^{16}

[Assumptions: 6×10^{10} protons per bunch; additional time is required for bunch manipulations and turning off magnetic switch at F17 in mixed modes.]

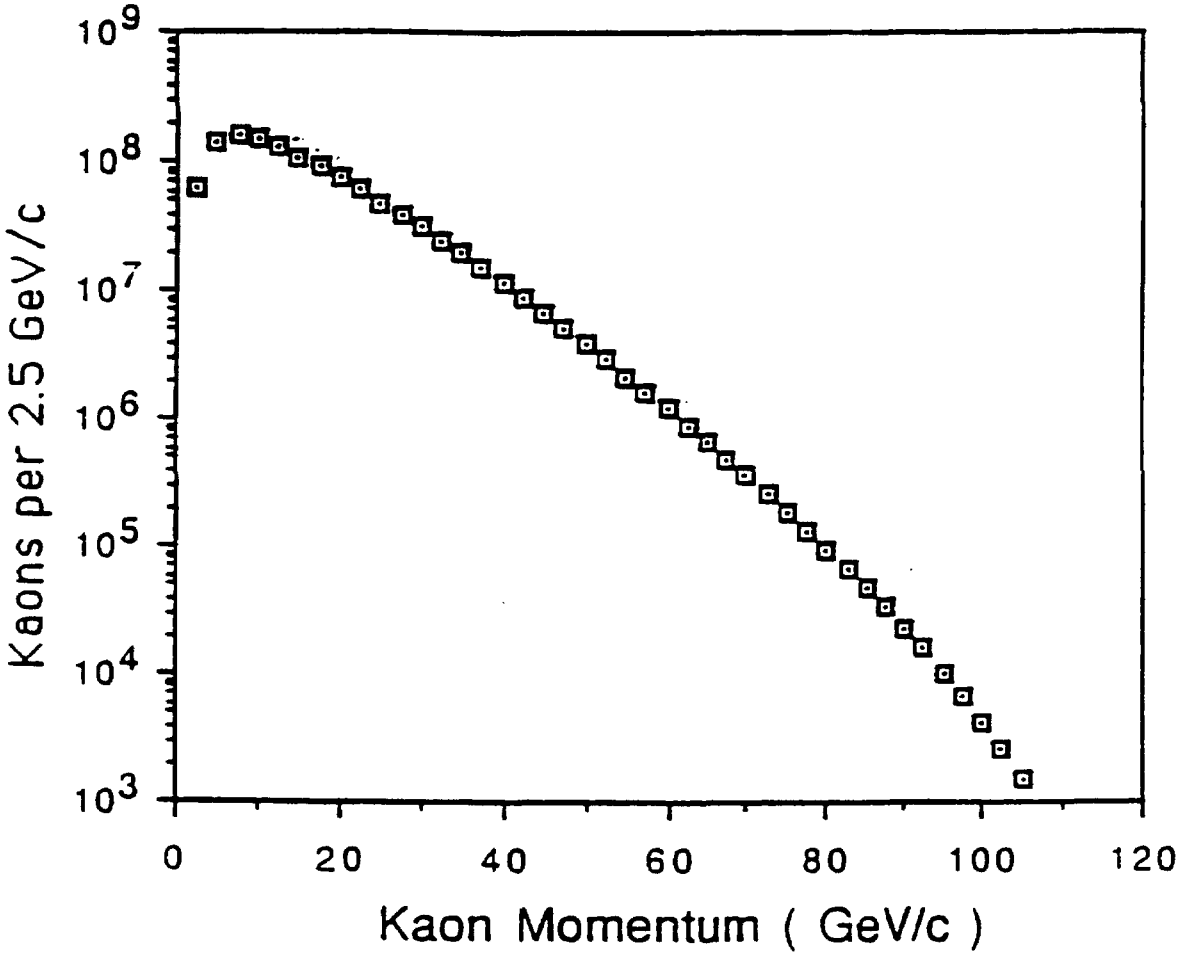


Figure 13. Main Injector: K^0 flux per 2.5 GeV assuming 3×10^{13} 120 GeV protons on a 50 cm target, 12 μstr beam, at 24 mrad targeting angle, including absorbers and filters.

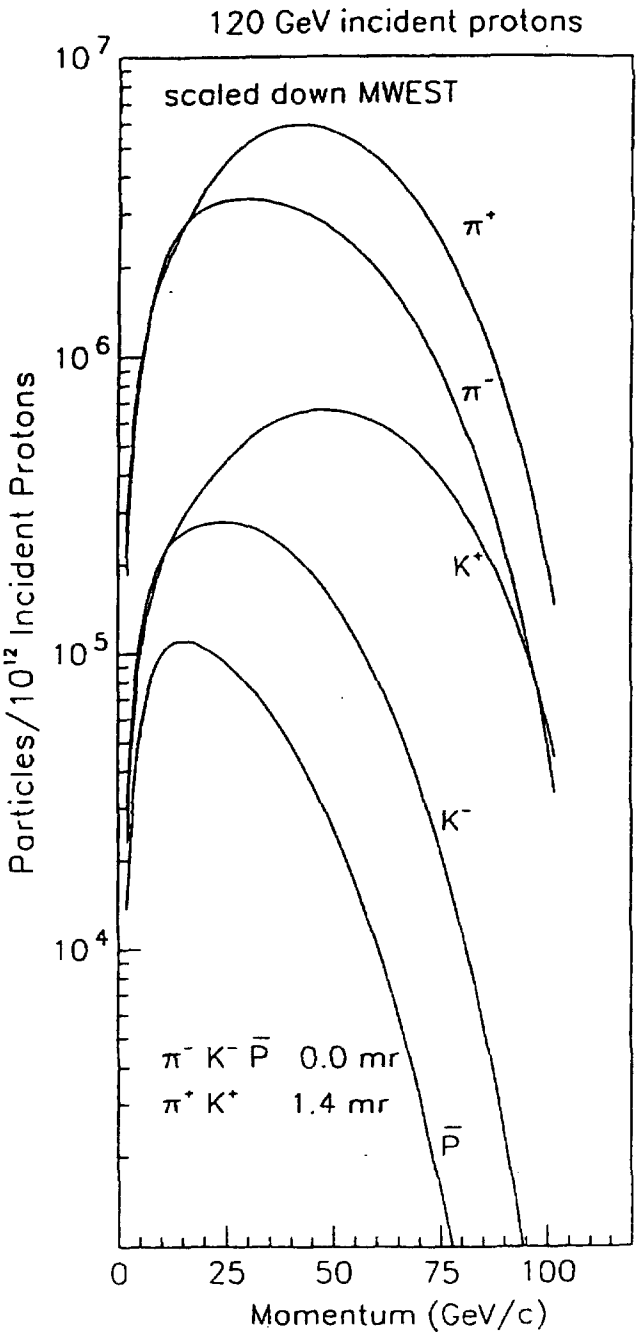


Figure 14. Main Injector: Fluxes scaled from the 800 GeV MW beamline.

SECTION IV. FERMILAB COMPUTING FACILITIES

The Computing Division provides services to advance the scientific mission of the Laboratory in the areas of data analysis, data storage/access, data acquisition, general scientific, technical and administrative computing, account management, email and World Wide Web services, and networking.

The current emphasis includes final preparations for Run II computing, especially operations, final reconstruction and analysis of the 1996-97 fixed-target run, reconstruction and analysis of the 1999 fixed-target data, preparations for MiniBooNE and MINOS, R&D on computing techniques (hardware and software), as well as calculations required for future accelerator projects. In addition, Fermilab has been selected as a Tier 1 Regional Computing Center for the CERN CMS experiment and work on this has begun.

The systems currently supported centrally by the Computing Division include the Linux PC farms, central general purpose interactive and batch, application and file services, Linux distribution and repository, central cvs code repositories, mass storage systems, and operations support systems. In addition the Computing Division provides central support for dedicated experiment systems: CDF and D0 central computing systems, KTeV and Sloan Digital Sky Survey central systems, CMS systems, and a system designed especially for theoretical physics calculations. Most of these systems are housed in the Feynman Computing Center.

FNALU is a cluster of UNIX machines representing many of the supported UNIX operating system flavors of the Laboratory including Linux. The cluster is used for application code development and porting to the various flavors, preproduction development of farms processing code, and analysis computing for smaller experiments. The cluster is also used for specialized computing tasks by making expensive licenses available to a wider user community.

The multiprocessor farm systems composed of PCs running Linux dominate the production computing capacity at the Laboratory and allow fast cost-effective event reconstruction and Monte Carlo calculations. The current capacity of the farms is approximately 10,749 SpecInt95. An additional 21,940 SpecInt95 will be added to the farms during 2001. Figure 15 shows the growth in farms utilization and a projection for Run II.

Approximately 300,000 user tapes are currently stored in the Feynman vaults. The division has STK, IBM and ADIC tape libraries in production. This equipment serves the Collider program, the Fixed Target program, US

CMS, and other elements of the Lab's program. It represents a capacity of over two petabytes. 8mm tape drives with capacities of about 60 GB/tape are being installed into tape libraries dedicated to CDF and D0. High capacity tape drives will be made available for other Laboratory projects in FY2001.

Computing at the Laboratory has become dependent on a very reliable, high-performance campus network. The Computing Division designs, implements, and supports the Laboratory's local network infrastructure and services. Off-site collaborators are supported over very high bandwidth connections to major research wide-area networks. A conceptual diagram of the Laboratory's network infrastructure is shown in Figure 16.

In 2001, the Computing Division will continue to upgrade the Laboratory's network infrastructure, with emphasis on wider deployment of gigabit ethernet. The CDF & D0 Run II networks will be expanded to accommodate additional office space at each location, and will be enhanced to keep pace with production Run II network requirements. New initiatives will include network support for the MiniBooNE and MINOS experiments. In the case of MINOS, network support will be extended to the far-end detector location at the Soudan Mine in Minnesota. Preliminary planning and early deployment of networking facilities for the Laboratory's CMS support effort will also be initiated in 2001.

The Computing Division continues its development and support for data acquisition test stands and experiments (D0 archiving system, CDF software event builder, MINOS CAMAC support, etc). Electronics development and support continue for trigger and data acquisition projects for Run II and beyond.

Through joint projects, CDF, D0 and the Computing Division have developed several software components and strategies in common - with development and support for such things as the experiment build systems (SRT), database administration (for ORACLE) and reconstruction physics utility libraries (ZOOM/CLHEP) being provided by the Division. The programs and libraries developed by these projects are being leveraged by new experiments such as MINOS and MiniBooNE. The Computing Division is also involved in ROOT development and support, in cooperation and collaboration with the ROOT team.

In Run II, the data volume will be a factor of 20 higher than Run I, and the challenge has led to a new data-handling model which incorporates robotic storage and access, which will give the experiments better access to the data. This model will also be extended to all future Fermilab experiments as the central robotic hardware and software systems are upgraded and improved.

The Run II computing challenge includes an almost full transition to C++ for reconstruction and analysis code and the acquisition, through purchase, "freeware" or Fermilab developments, of new supporting applications in all areas of online and offline computing. The anticipated

longevity of the code has led to increased attention on code development, distribution, validation, and testing tools and process.

The Computing Division is engaged in R&D efforts towards the future program of the Laboratory in the areas of distributed data handling (grid systems) for CMS (large scale Linux cluster management) and operation in support of HEP and lattice gauge calculations, and trigger and data acquisition for BTeV. In some cases the R&D has led to production activity. The first PCQCD cluster is in place and should be available for lattice calculations in the year 2001, for example.

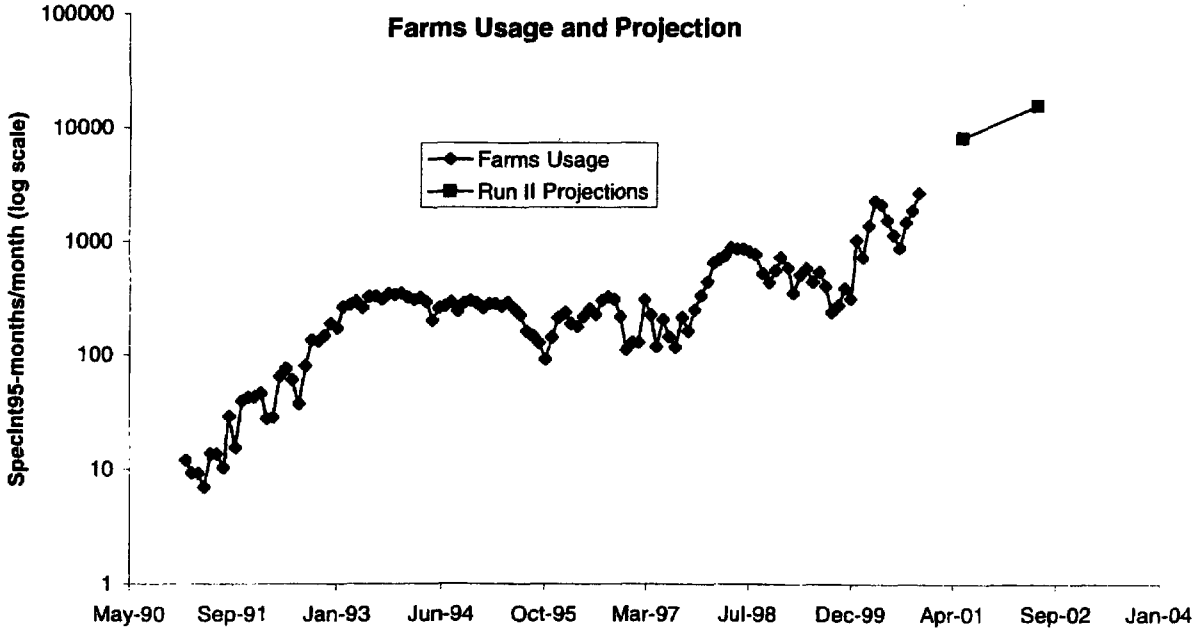


Figure 15. Growth in farms utilization since 1991 and Run II projections.

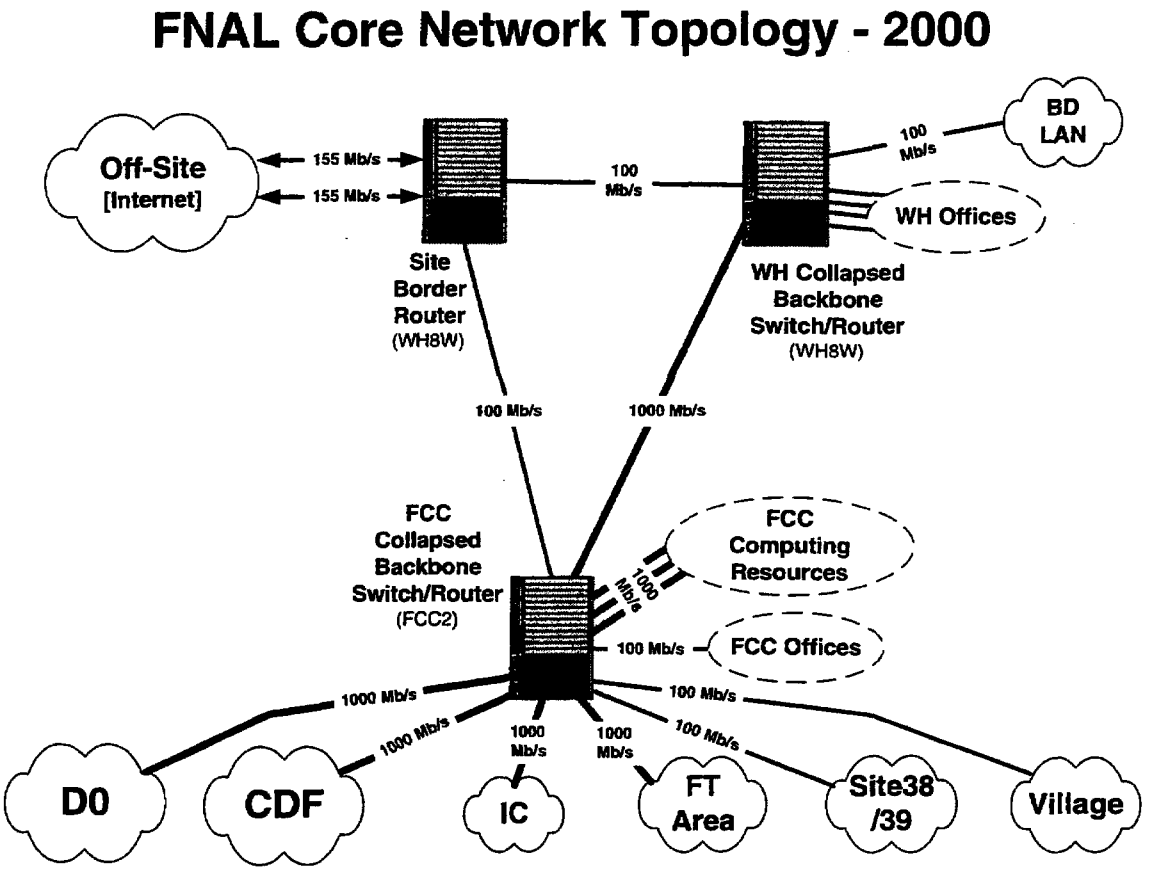


Figure 16. Conceptual diagram of Fermilab's networking infrastructure.

SECTION V. MAJOR RESEARCH ACTIVITIES DURING 2000 AND 2001

Information on the Fermilab research program during 2000 and early 2001 is given in the following pages. Figure 17 shows when beam was delivered to the experimental areas; Table 4 describes the major research activities in a little more detail.

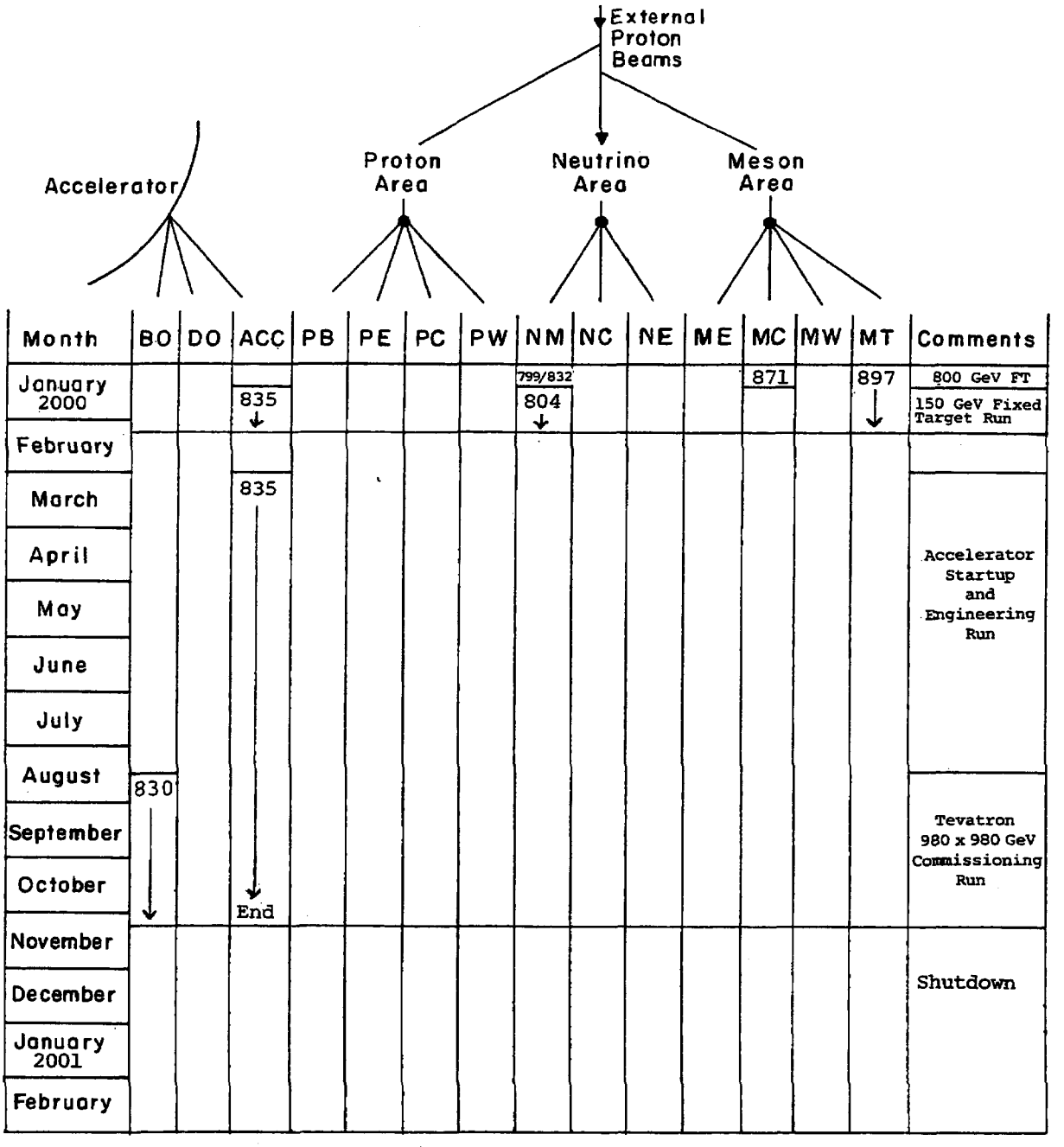


Figure 17. Major experiments running at Fermilab in 2000 and 2001 (through February).

TABLE 4. DESCRIPTION OF MAJOR RESEARCH ACTIVITIES DURING 2000 AND 2001 (through February)

EXP. #	
	ACCUMULATOR
835	Charmonium states - setup and data-taking
	NEUTRINO AREA
799	Rare K_L^0 decays - data-taking
804	Tests for proposed KAMI experiment
832	Search for direct CP violation in $K_L^0 \rightarrow 2\pi$ - data-taking
	MESON AREA
871	Search for CP violation in Ξ and Λ decays - data-taking
897	Tests for BTeV experiment
	COLLIDER
830	CDF - checkout

SECTION VI. FERMILAB RESEARCH PROGRAM

This Section contains information on the Fermilab research program for the next few years. The Situation Report, given on pages 32-33, is a summary of the current status of the experimental program. Figure 18, based on the Situation Report, illustrates by beam line the major approved experiments that have not yet completed data-taking.

Fermi National Accelerator Laboratory
Experiment Program Situation Report as of January 31, 2001

The Experimental Program situation at Fermilab is summarized below. The experiments are listed by experimental area and beamline under categories that best describe their status as of January 31, 2001. The experimental area names are abbreviated as follows: Meson Area (**MA**); Neutrino Area (**NA**); Proton Area (**PA**); Collision Area (**COL**); Accumulator Ring (**ACCUM RING**); Debuncher Ring (**DBNCHR RING**); Booster Accelerator (**BOOSTR**); Unspecified (**UNSPEC BEAM**); Beam from the Main Injector (**MAIN INJECTOR**) and A0 Facility (**A0 Facility**).

Total number of approved experiments - 446

Beam Area & Line		Experiment	Spokesperson(s)	
EXPERIMENTS THAT ARE COMPLETED (401)				**Completion Date**
(Note: Only experiments which were completed since January 1, 1999 are listed.)				
MA	ME	B-QUARK MESONS & BARYONS #789	(PENG, KAPLAN)	MAR 01, 1999
	MP	POLARIZED BEAM #704	(YOKOSAWA)	MAR 01, 1999
	MC	HYPERCP PARTICLE MEASUREMENT #917	(GUSTAFSON)	MAR 01, 2001
	MT	B PHYSICS TEST BEAM PROGRAM #T880	(BUTLER, STONE)	MAR 01, 2001
		DIAMOND DETECTOR TEST #911	(STONE)	JAN 21, 2000
		HADRON CALORIMETER TEST #912	(TAKESHITA, KAMON)	SEP 30, 1999
		TRD TEST #913	(SWORDY)	JAN 21, 2000
	MW	HADRON JETS #672A	(ZIEMINSKI)	MAR 01, 1999
		DIRECT PHOTON PRODUCTION #706	(SLATTERY)	MAR 01, 1999
		COSMIC RAY CALORIMETER CALIBRATION #T883	(ADAMS)	MAR 01, 2001
NA	NM	TEVATRON MUON #665	(SCHELLMAN)	MAR 01, 1999
	NE	PARTICLE SEARCH #690	(KNAPP)	MAR 01, 1999
PA	PE	PION & KAON CHARM PROD. #769	(APPEL)	MAR 01, 1999
		HADROPRODUCTION HEAVY FLAVORS #791	(APPEL, PUROHIT)	MAR 01, 1999
	PB	PHOTOPRODUCTION OF JETS #683	(CORCORAN)	MAR 01, 1999
		PHOTOPRODUCTION OF CHARM AND B #687	(BUTLER, CUMALAT)	MAR 01, 1999
	PW	BEAUTY PRODUCTION BY PROTONS #771	(COX)	MAR 01, 1999
COL	C-0	TEVATRON CRYSTAL EXTRACTION #853	(MURPHY)	MAR 01, 2001
	E-0	PBAR P ELASTIC SCATTERING #811	(OREAR)	MAR 01, 2001
ACCUM RING		CHARMONIUM STATES #760	(CESTER)	MAR 01, 1999
		ANTI-HYDROGEN DETECTION #862	(CHRISTIAN)	MAR 01, 1999
		ANTIPROTON DECAY #868	(GEER)	MAR 01, 2001
EXPERIMENTS THAT ARE ANALYZING DATA (14)				**Last Run**
MA	ME	ANTI(U-QUARK)/ANTI(D-QUARK) DIST#866	(LEITCH)	AUG 06, 1997
	MC	CP VIOLATION #871	(DUKES, LUK)	JAN 21, 2000
NA	NC	NEUTRINO #815	(BERNSTEIN, SHAEVITZ)	SEP 05, 1997
	NM	CP VIOLATION #799	(BARKER)	JAN 17, 2000
		CP VIOLATION #832	(BLUCHER)	JAN 17, 2000
PA	PB	HEAVY QUARK PHOTOPRODUCTION #831	(CUMALAT, MORONI)	AUG 25, 1997
	PC	LARGE-X BARYON SPECTROMETER#781	(RUSS)	SEP 03, 1997
	PW	TAU NEUTRINO #872	(PAOLONE, LUNDBERG)	SEP 03, 1997
COL	B-0	CDF UPGRADE #775	(CARITHERS, JR., BELLETTINI)	FEB 20, 1996
		CDF HARD DIFFRACTION STUDIES #876	(ALBROW)	FEB 20, 1996
	C-0	BTEV R&D #897	(BUTLER, STONE)	JUL 21, 2000
	D-0	D-0 DETECTOR #740	(GRANNIS, MONTGOMERY)	FEB 20, 1996
ACCUM RING		CHARMONIUM STATES #835	(CESTER, PORDES)	NOV 08, 2000
OTHER		SEARCH FOR LOW MASS MONOPOLES #882	(KALBFLEISCH)	MAR 01, 2001
EXPERIMENTS THAT ARE IN PROGRESS (7)				
MAIN INJECTOR		KAMI R&D #804	(RAY, WAH)	
		CKM R&D #905	(COOPER)	
OTHER		SLOAN DIGITAL SKY SURVEY #885	(KENT)	
		DARK MATTER SEARCH #891	(DIXON)	
		RECYCLER ELECTRON COOLING #901	(NAGAITSEV)	
A0 FACILITY		PICOSECOND X-RAY SOURCE #886	(MELISSINOS)	
		PLASMA WAKE-FIELD ACCELERATOR TEST #890	(ROSENZWEIG)	
EXPERIMENTS THAT ARE BEING INSTALLED (1)				
COL	B-0	CDF MINIPLUGS #916	(GOSHAW, BEDESCHI)	

Fermi National Accelerator Laboratory
Experiment Program Situation Report as of January 31, 2000

(Continued)

EXPERIMENTS TO BE SETUP WITHIN A YEAR (6)

COL B-0	CDF UPGRADE #830	(BEDESCHI, GOSHAW)
	CDF INNER SILICON AND TOF #909	(BEDESCHI, GOSHAW)
D-0	D-0 DETECTOR UPGRADE #823	(WEERTS, WOMERSLEY)
	D-0 FORWARD PROTON DETECTOR #900	(WEERTS, WOMERSLEY)
	D-0 SILICON TRACK TRIGGER #908	(WEERTS, WOMERSLEY)
BOOSTR	MINIBOONE #898	(CONRAD, LOUIS)

OTHER APPROVED EXPERIMENTS (6)

COL C-0	B PHYSICS AT THE TEVATRON #918	(BUTLER, STONE)
MAIN INJECTOR	NEUTRINO OSCILLATIONS #875	(WOJCICKI)
OTHER	AUGER PROJECT R&D #881	(MANTSCH)
	CMS AT FERMILAB #892	(GREEN)
	LHC ACCELERATOR #893	(STRAIT)
	US CMS SILICON TRACKER #919	(GREEN)

PENDING PROPOSALS (6)

UNSPEC BEAM	MUON COOLING R&D #904	(GEER)
MAIN INJECTOR	P-BAR+NUCLEI STUDIES #888	(VIOLA)
	EXOTIC ATOMS #902	(IVANOV)
	ANTI(U-QUARK)/ANTI(D-QUARK) DIST #906	(GEESAMAN)
	PARTICLE PRODUCTION #907	(RAJA)
BOOSTR	TEST FOR ANTIHYDROGEN SPECTROSCOPY #903	(MANDELKERN)

COLLIDER

B0	830/909/916 *Bedeschi /* Goshaw	ANL, Bologna, Brandeis, UC/Davis, UCLA, Cantabria, Carnegie Mellon, Chicago, Duke, Fermilab, Florida, Frascati, Geneva, Glasgow, Harvard, Hiroshima, Illinois, IPP/Canada, ITEP, JINR, *Johns Hopkins, Karlsruhe, KEK, Korea Nat. Coll. Lab.,* LBNL, Liverpool, Michigan, Michigan State, MIT, New Mexico, Northwestern, Ohio State, Okayama, Osaka City, Oxford, Padova, Pennsylvania, Pisa, Pittsburgh, Purdue, Rochester, Rockefeller, Rome, Rutgers, Taiwan, Texas A&M, Texas Tech, Trieste/Udine, Tsukuba, Tufts, Univ. Coll. London, Waseda, Wisconsin, Yale	CDF Detector
C0	918 Butler / Stone	UC/Davis, Colorado, Fermilab, Florida, Houston, IHEP/Protvino, IIT, Illinois, Indiana, INFN/Milano, Iowa, Minnesota, Nanjing, New Mexico State, Ohio State, INFN/Pavia, Pennsylvania, Puerto Rico/Mayaguez, USTC/China, Shandong, Southern Methodist, SUNY/Albany, Syracuse, Tennessee, Tufts, Valparaiso, Vanderbilt, Wayne State, Wisconsin, Yale, York	BTeV Detector
D0	823/900/908 *Weerts /* Womersley	los Andes, Amsterdam/NIKHEF, Arizona, BNL, Boston, Brown, Buenos Aires, UC/Irvine, UC/Riverside, CSU/Fresno, CBPF, Charles, CINVESTAV, Columbia, Czech Acad. Sci., Czech Tech, Delhi, Estadual Paulista, Fermilab, Florida State, Grenoble, *IHEP/Beijing, IHEP/Protvino, Illinois/Chicago, Imperial Coll., Indiana, INP/Krakow,* Iowa State, ITEP, JINR, Kansas, Kansas State, Lancaster, Langston, LBNL & UC/Berkeley, LMU, Louisiana Tech, Mainz, Manchester, Marseille, Maryland, Michigan, Michigan State, Moscow State, Nebraska, Nijmegen, Northeastern, Northern Illinois, Northwestern, Notre Dame, Oklahoma, Orsay, Panjab, Paris VI & VII, PNPI, Quito, Rice, Rio de Janeiro, Rochester, Saclay, SUNY/Stony Brook, Tata, Texas/Arlington, Virginia, Washington	D0 Detector

BOOSTER

	898 Conrad / Louis	Alabama, Bucknell, UC/Riverside, Cincinnati, Columbia, Embry Riddle, Fermilab, Indiana, LANL, Louisiana State, Michigan, Princeton	MiniBooNE

MAIN INJECTOR

	875 Wojcicki	*ANL, Athens,* BNL, Caltech, *Cambridge, Chicago,* Elmhurst, Fermilab, Harvard, IHEP/Beijing, IHEP/Protvino, Indiana, ITEP, James Madison, JINR, Lebedev, LLNL, Macalester, Minnesota, Minnesota/Duluth, Northwestern, Oxford, Pittsburgh, Rutherford, South Carolina, Stanford, Sussex, Texas A&M, Texas/Austin, Tufts, Univ. Coll. London, Western Washington, Wisconsin	Neutrino Oscillations

Figure 18. Fermilab experimental program, showing all major approved experiments that have not yet completed data-taking.

SECTION VII. SUMMARIES OF APPROVED EXPERIMENTS

Summaries are given in this Section of major approved experiments which have not yet completed data-taking, and also those major experiments still carrying out a significant analysis effort. Most were prepared recently by the experiment spokesperson(s).

This section also includes summaries of significant experimental physics activities in which Fermilab physicists are involved, but which are not particle physics experiments at Fermilab accelerators. (Note that in the user/institution statistics, only the Fermilab physicists on these activities are included.)

The statistics on Fermilab users are given in Table 5, together with information on how they are derived.

TABLE 5. DATA ON FERMILAB USERS

The data given below are based on the following:

1. Data on Fermilab users are updated annually, generally about January of each year.

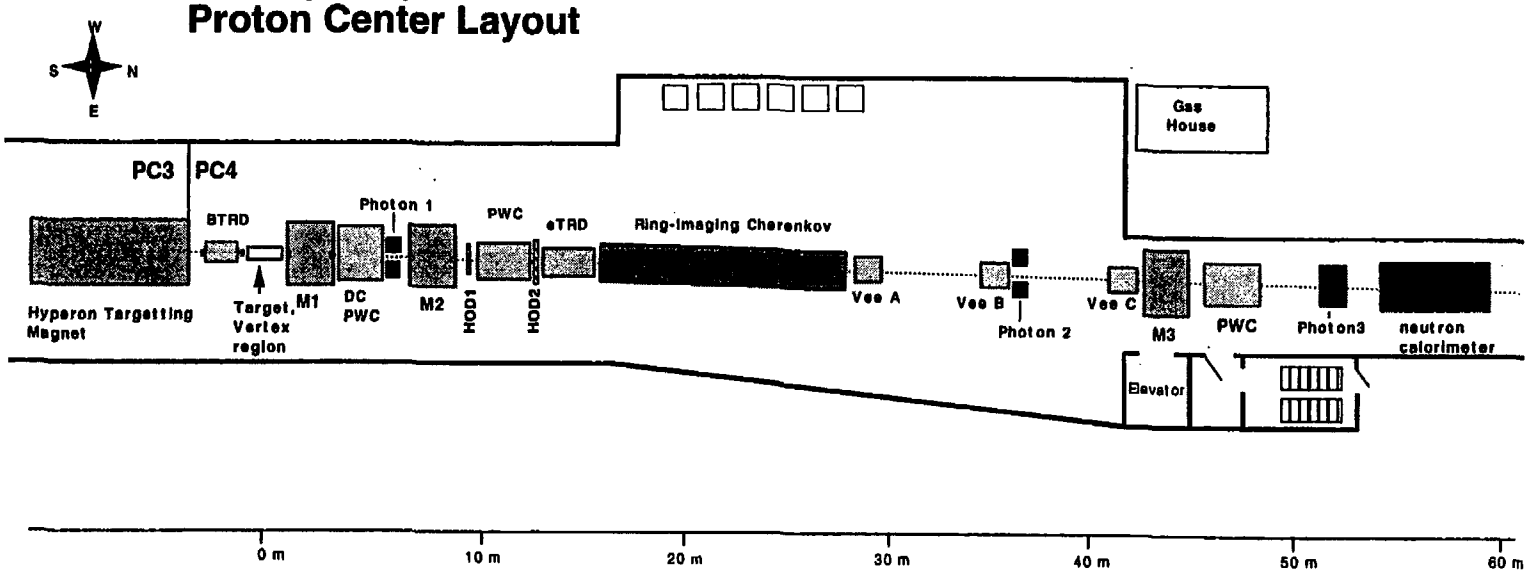
2. Fermilab experiments included in the list are those approved by the Laboratory, and in one of the following stages: detailed design, construction, data-taking, or data analysis (listed in Sections B-G in the Experimental Program Situation Report on pages 30-31). The experiment personnel is supplied by the experiment spokespersons, and is divided into physicists or graduate students. Also included are Fermilab physicists who are involved in significant experimental physics activities which are not particle physics experiments at Fermilab accelerators and are listed in the Situation Report; this includes such activities as collaboration on astrophysics experiments and on the CMS experiment at the CERN LHC.

3. Although a user or an institution may be involved in more than one experiment, he/she/it is only counted once in any totals.

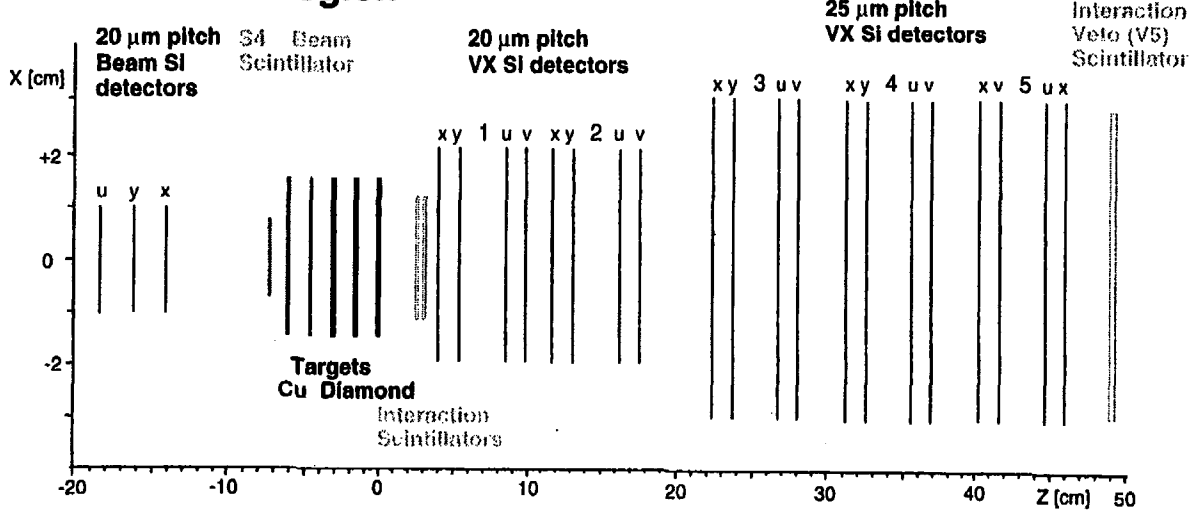
4. When experiments pass into the data analysis stage, students may graduate and move to other experiments and/or institutions, as also may more senior researchers. For experiments in the data analysis stage, we list users and institutions as of the data-taking phase.

	Physicists	Students	Subtotal	Institutions
US				
University	698	368	1066	92
Industry	0	0	0	0
National Lab.	380	17	397	8
Subtotal	1078	385	1463	100
Non-US				
University	362	149	511	79
Industry	0	0	0	0
National Lab.	285	23	308	21
Subtotal	647	172	819	100
Total	1725	557	2282	200

Selex (E781)
Proton Center Layout



Vertex Region



E-781 (Russ) Study of Charm Baryon Physics

Bogazici (Turkey), Bristol (United Kingdom), Carnegie-Mellon, CBPF (Brazil), Fermilab, Hawaii, IHEP/Beijing (China), IHEP/Protvino (Russia), Iowa, ITEP (Russia), Moscow State (Russia), MPI/Heidelberg (Germany), Paraiba (Brazil), PNPI (Russia), Rochester, INFN/Rome (Italy), Rome (Italy), San Luis Potosi (Mexico), Sao Paulo (Brazil), Tel Aviv (Israel), INFN/Trieste (Italy), Trieste (Italy)

Status: *Data Analysis*

The Fermilab fixed-target program has long been concerned with understanding the physics of charm hadron production and decays. The aim of E-781 was to complement previous or contemporaneous work in hadroproduction and photoproduction by emphasizing physics at large Feynman-x, where the charm hadron carries off a large fraction of the incident beam momentum. Most charm hadroproduction experiments have used only pion beams and worked near $x_F = 0$, where production of all types of secondary particles is maximal. Charm mesons are by far the dominant charm species in these experiments. Empirical observations of the strange hyperons indicate that the baryon/meson ratio increases at large x_F. E-781 is unique in its ability to see whether this feature of hadroproduction also holds true for heavy quark systems like charm. There are also important features of charm hadroproduction that may depend on the incident beam particle. E-781, using different beam hadrons from the Fermilab hyperon beam, is the only experiment that can address these issues.

E-781 employed a novel impact-parameter software trigger to select charm candidates for writing to tape. Charm particles have a short but finite decay length. A high-resolution vertex detector close to the production point can select charm candidates based on the miss-distance of the decay tracks evaluated at the primary production vertex. E-781 built a 50,000 strip silicon vertex detector system to reconstruct on-line all high-momentum (>15 GeV/c) tracks from each interaction with 6 micron resolution. Events were recorded on tape only when the reconstruction indicated that these tracks did NOT come from a single primary vertex. The goal was to take a large data set with a loose hardware trigger but to avoid huge software overheads in extracting physics. The full spectrometer, shown in the accompanying figure, includes a two-stage magnetic spectrometer and excellent particle identification information from the downstream Ring-Imaging Cerenkov Counter. This is especially important for identifying charm baryon decays in the large x_F region.

Physics questions for charm studies have to do both with production and decay mechanisms. In charm baryon decays, the charm quark may decay or interact through exchange mechanisms with the light quarks. Unlike meson decays, there is no helicity suppression for exchanges, and a rich spectrum of quasi-two-body decay modes may occur. Do they? There is little experimental information on the question. Such a study requires good charged-particle identification and good photon detection. Comparison of non-leptonic and semi-leptonic decays is also important. E-781 has good photon coverage,

electron tagging and fast charged-particle identification. We expect to make new studies of the higher-order corrections to the charm decay mechanisms explored by combining Heavy Quark Effective Theory and perturbative QCD.

Strong interaction physics can be studied in the production of charm hadrons. Strange hyperons show intriguing polarization effects in strong production. What happens for charm baryons? E-781 expects to measure polarizations. There are open questions about possible direct charm content of non-charmed mesons and nucleons, as well as color-drag effects in production at large x_F. Such studies demand comparisons between different beam hadrons and also good acceptance at large x_F. E-781 is designed to make these studies.

The physics potential of the experiment touches many little-known areas of heavy quark physics. The focus on charm baryons is especially appropriate for a hadron machine. The experiment recorded events from 15 billion inelastic collisions during the 1996-97 fixed-target period. We developed a run-time Data Summary Tape (DST) strategy for the first-level processing pass, akin to the skimming pass of the Tevatron Collider experiments. We identified interesting events during initial track reconstruction and wrote out condensed records having only physics information and identifiers for those events. Sample charm mass plots from this condensed output file can be seen in the figure. This has worked well. Initial physics results have been presented at conferences and have been submitted to journals. Topics range from total cross section measurements to precision charm hadron lifetimes to new features of charm hadroproduction.

We are now making the second analysis pass over all data to improve selection of the charm-strange baryons that are a main interest in this charm baryon experiment. That pass will be done by summer, 2001. Analysis should continue for another year after that.

Publications

Observation of the Cabibbo Suppressed Decay $\Xi_c^+ \rightarrow pK^-\pi^+$, S. Y. Jun et al., Phys. Rev Lett. 84, 1857 (2000).

Total Cross-Section Measurements with π^-, Σ^- and Protons on Nuclei and Nucleons Around 600 GeV/c, U. Dersch et al., accepted for publication in Nucl. Phys. B (2000).

Theses

U. Dersch, Max Planck Institute für Kernphysik, Germany
I. Eschrich, Max Planck Institute für Kernphysik, Germany
F. Garcia, Univ. of Sao Paulo, Brazil
M. Kaya, Univ. of Iowa
H. Kruger, Max Planck Institute für Kernphysik, Germany
A. Kushnirenko, Carnegie Mellon Univ.

P. Mathew, Carnegie Mellon Univ.
K. Nelson, Univ. of Iowa
A. Ocherashvili, Tel Aviv Univ., Israel
P. Pogodin, Univ. of Iowa
J. Simon, Max Planck Institute für Kernphysik, Germany
K. Vorwalter, Max Planck Institute für Kernphysik, Germany

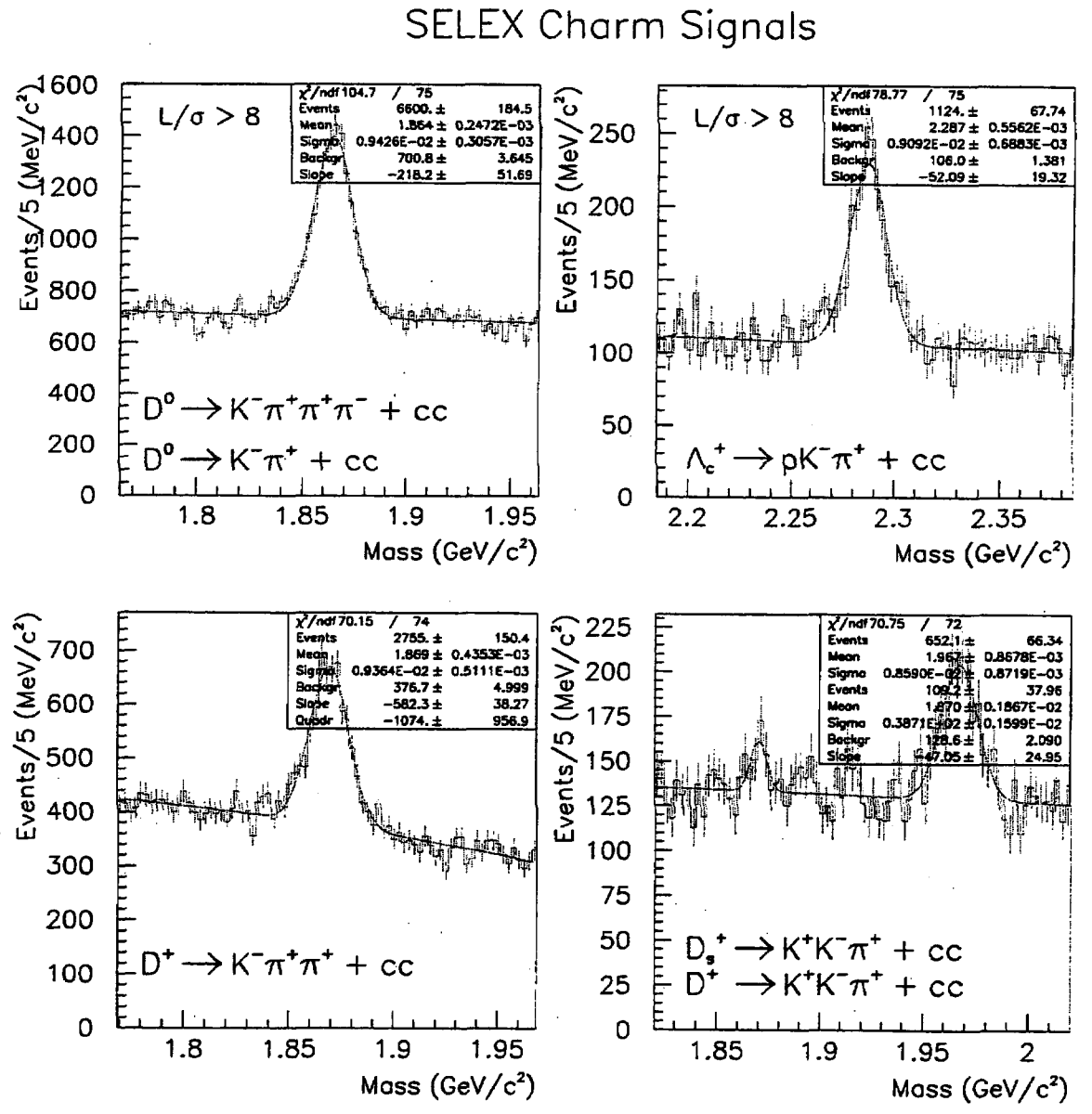
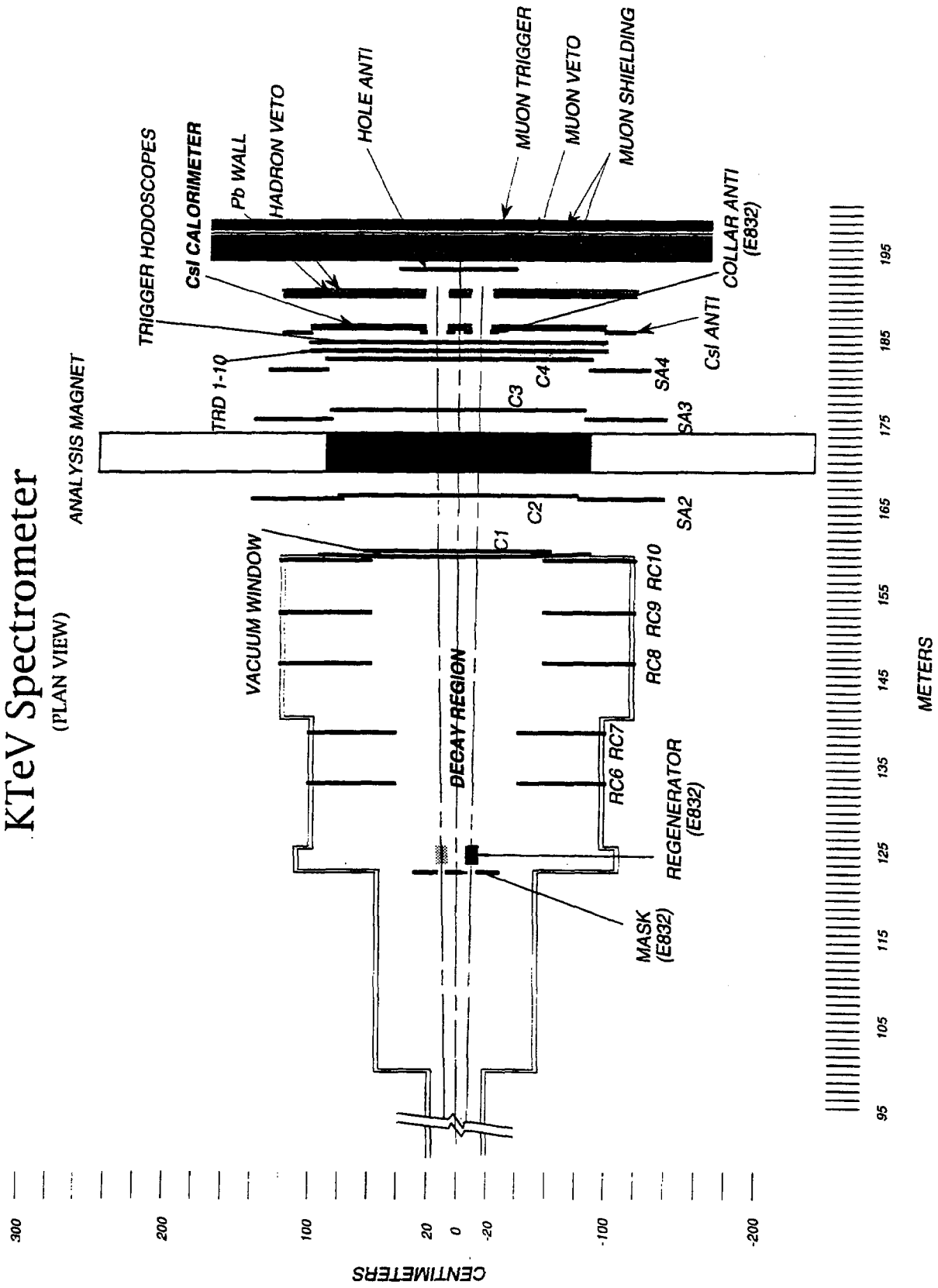


Figure 1. Sample charm mass plots from E-781.


KTeV Spectrometer
(PLAN VIEW)
ANALYSIS MAGNET
TRIGGER HODOSCOPES
CsI CALORIMETER
Pb WALL
HADRON VETO
HOLE ANTI
MUON TRIGGER
MUON VETO
MUON SHIELDING
COLLAR ANTI (E832)
CsI ANTI
TRD 1-10
C3
C4
SA4
SA3
C2
SA2
C1
VACUUM WINDOW
DECAY REGION
RC8 RC9 RC10
RC6 RC7
REGENERATOR (E832)
MASK (E832)
300
200
100
20
0
-20
-100
-200
CENTIMETERS
95
105
115
125
135
145
155
165
175
185
195
METERS

E-799 (Barker) / E-832 (Blucher) Rare Decays of K_L^0 and a Search for Direct CP Violation in $K_L^0 \to 2\pi$

Arizona, UCLA, UC/San Diego, Campinas (Brazil), Chicago, Colorado, Elmhurst, Fermilab, Osaka (Japan), Rice, Rutgers, Sao Paulo (Brazil), Virginia, Wisconsin

Status: *Data Analysis*

KTeV (Kaons at the Tevatron) consists of two experiments: E-799 II (a rare K_L decay experiment) and E-832 (search for direct CP violation in $K_{L,S} \to 2\pi$).

E-799 is an experiment to search for rare K_L decays, such as $K_L \to \pi^0 l^+ l^-$ (l = e, μ, ν), and many other multibody rare decays, to a sensitivity of 10^{-11}.

E-799 Phase I ran from October 1991 until January 1992, with a lead-glass calorimeter and spectrometer in the Meson Center beamline. The table below summarizes the published results from E-799 Phase I.

Decay Mode	E-799I BR results	Paper
$\pi^0 \to ee$	$(7.6\ ^{+3.9}_{-2.8} \pm 0.5) \times 10^{-8}$	PRL 71, 34 (1993)
$K_L \to \pi^0 ee$	$< 4.3 \times 10^{-9}$	PRL 71, 3918 (1993)
$K_L \to \pi^0 \mu\mu$	$< 5.1 \times 10^{-9}$	PRL 71, 3914 (1993)
$\pi^0 \to \mu e$	$< 8.6 \times 10^{-9}$	PL B320, 407 (1994)
$K_L \to eeee$	$(3.96 \pm 0.78 \pm 0.32) \times 10^{-8}$	PRL 72, 3000 (1994)
$K_L \to \pi^0 \nu\bar{\nu}$	$< 5.8 \times 10^{-5}$	PRL 72, 3758 (1994)
$K_L \to \pi^0 \pi^0 \gamma$	$< 2.3 \times 10^{-4}$	PR D50, 1874 (1994)
$K_L \to ee\gamma\gamma$	$(6.5 \pm 1.2 \pm 0.6) \times 10^{-7}$	PRL 73, 2169 (1994)
Λ, $\bar{\Lambda}$ polarization		PL B338, 403 (1994)
$K_L \to \mu\mu\gamma$	$(3.23 \pm 0.23 \pm 0.19) \times 10^{-7}$	PRL 74, 3323 (1995)
$K_L \to ee\mu\mu$	$(2.9\ ^{+6.7}_{-2.4}) \times 10^{-9}$	PRL 76, 4312 (1996)
$K_L \to \pi^0 \mu e$	$< 3.2 \times 10^{-9}$	Submitted to PRL

The goal of E-832 is a measurement of the ratio of the CP violation parameters, ε'/ε, in the $K^0\bar{K}^0$ system to a precision of 1.0×10^{-4}, to search for direct CP violation phenomenon at the Fermilab Tevatron. This is a factor of seven improvement in precision over the previous Fermilab experiment E-731 and the CERN experiment NA31.

So far the only manifestations of CP violation are a result of a lack of symmetry in the rate of particle-antiparticle transitions in the $\Delta S = \pm 2$

processes $K^0 \leftrightarrow \bar{K}^0$. This experiment addresses the issue as to whether the CP violation is confined to a $\Delta S = 2$ interaction (the superweak model) or has a $\Delta S = 1$ component, as naturally arises in the standard six-quark model (Cabbibo-Kobayashi-Maskawa).

The E-832 experiment makes use of a double-beam technique, essentially the same as E-731, whereby both K_L and K_S decays are studied simultaneously: a totally active regenerator is placed in one of the beams to provide a K_S component with very small background and the regenerator is alternated from beam to beam to reduce the effects of any beam and detector asymmetries. The goal of the experiment is to collect 6×10^6 $K_L \rightarrow 2\pi^0$ events along with 1.0×10^7 $K_S \rightarrow 2\pi^0$ "normalizing" events, and at the same time to collect 3×10^7 $K_L \rightarrow \pi^+\pi^-$ events and 4.5×10^7 $K_S \rightarrow \pi^+\pi^-$ "normalizing" events for the ε'/ε measurement.

For the effort of E-832 and Phase II of E-799, a new KTeV facility was constructed which takes full advantage of the Tevatron primary protons up to 5×10^{12} per spill and its superior duty cycle to provide a factor of three increase in usable K_L flux in the 100 GeV/c region over E-731. Special attention has been paid to significantly improving the neutral beam stability, reducing the neutral beam halo, and reducing the background muon rate. The spectrometer consists of a 60 meter vacuum decay space, electromagnetic calorimetry, tracking and magnetic spectrometer, nearly hermetic photon vetoes, transition radiation detectors, and hadron and muon detectors.

The neutral final state ($2\pi^0$) is detected with a new 1.9m×1.9m high resolution (better than 1%) electromagnetic calorimeter made of an array of 3100 blocks of pure CsI crystals. A newly developed "digital" PMT base (digitizing the PMT signal with a charge integrator and encoder, a flash ADC and a data buffer right on the base and running at 53 MHz) is used to read out the CsI array for better performance of the calorimeter in the higher rate environment. Better than 1% energy resolution from the CsI calorimeter has been achieved. Triggering in the neutral mode is effected by counting clusters in the CsI array by a hardware cluster finder. The $\pi^+\pi^-$ are detected with a 2000 sense-wire high-rate drift chamber spectrometer. A new, large-aperture KTeV magnet, providing a p_T kick up to 450 MeV/c, is used for momentum measurement of charged particles. Scintillation hodoscope counters and an improved in-time track processor are used for the charged trigger. The most serious background, $K_L \rightarrow 3\pi^0$, is significantly reduced by means of a nearly hermetic system of 12 new photon-veto anti-counters, designed to detect extra photons outside the solid angle of the CsI calorimeter including the beam holes. Inelastic regeneration is greatly reduced by the detection of the production of secondaries in the totally active scintillation regenerator. The $K_{\mu3}$ background is rejected by the muon shielding and anti-counters behind the CsI calorimeter, and by crude hadron vetoes. A new buffer matrix data acquisition system with a level-3 parallel processing filter is used for the high data rate environment.

With the long decay space, the experiment can also measure the K_L-K_S interference in both the $2\pi^0$ and $\pi^+\pi^-$ data sample to obtain $\Delta\phi$, the phase

difference between ϕ_{00} and ϕ_{+-}, to a precision of 0.2^o, a very stringent test of CPT invariance.

The experiment first took about 10 months of data divided between E-799 and E-832 during the 1996-97 fixed-target run. After some detector modifications to improve systematic data quality and data-taking efficiency, KTeV collected data again in the 1999 fixed-target run. The 1999 run doubled the E-832 data sample from 1996-97 and almost tripled the E-799 data sample. The full data sample (1996+1997+1999) should allow E-832 to reduce the statistical error on ε' to 1×10^{-4}; significant work will be required to reduce the systematic error to this level.

The combined (1997+1999) E-799 rare decay data set corresponds to a flux of about 1×10^{12} K_L decays and a large number of cascade (hyperon) decays. This rich data set together with high precision electromagnetic calorimetry and excellent particle ID (TRD system) provides access to rare kaon decay sensitivities in the 10^{-11} range.

KTeV has already published or submitted more than a dozen papers based on the 50 terabytes data sample collected during the 1996-97 run. Those papers published or accepted for publication are listed below. For the E-799 rare decay program, notable results include:

1) We have discovered an asymmetry of $14.6\ ^{+/-\ 2.3}_{+/-1.1}$ in the angle between the pion and electron decay planes in the decay $K_L \rightarrow \pi^+\pi^-e^+e^-$. This asymmetry represents the largest CP-violating signal to date, and is also manifestly T-violating, directly demonstrating that time reversal symmetry is violated.

2) Analysis of the 1997 data has placed the best limits on the decays $K_L \rightarrow \pi^0e^+e^-$, $K_L \rightarrow \pi^0\mu^+\mu^-$ and $K_L \rightarrow \pi^0\nu\bar{\nu}$, which are expected to occur at the 10^{-11} level and have large CP-violating components.

In February 1999, the first ε'/ε result based on 25% of the 1996-97 E-832 data sample (1/8 of the full KTeV data sample) was announced. The result that Real $\varepsilon'/\varepsilon = (28.0 +/- 4.1)\times10^{-4}$ definitively establishes the existence of direct CP violation. The observation of direct CP violation represents the first fundamentally new information about CP violation since the discovery of $K_L \rightarrow \pi^+\pi^-$ decays in 1964. KTeV plans to announce a new ε'/ε result based on the remaining 1996-97 data in spring 2001, and analysis of the 1999 data sample is progressing well.

In addition to the production physics program in the 1999 run, an important set of engineering data was collected that will be critical for the design of the KAMI (KAons at the Main Injector) experiment. The goal of the KAMI experiment is a measurement of the purely CP-violating process $K_L \rightarrow \pi^0\nu\bar{\nu}$.

Publications

Design and Test Results of a Transition Radiation Detector for a Fermilab Fixed Target Rare Kaon Decay Experiment, G. E. Graham et al., Nucl. Instr. and Meth. A367, 224 (1995).

Development of a Parallel Plate Proportional Counter TRD with Suppressed Sensitivity to Ionization, N. Solomey et al., Nucl. Instr. and Meth. A367, 252 (1995).

Beam Test of Prototype CsI Calorimeter, R. S. Kessler et al., Nucl. Instr. and Meth. A368, 653 (1996).

Search for Light Gluinos Via the Spontaneous Appearance of $\pi^+\pi^-$ Pairs with an 800 GeV/c Proton Beam at Fermilab, J. Adams et al., Phys. Rev. Lett. 79, 4083 (1997).

Measurement of the Branching Fraction of the Decay $K_L \rightarrow \pi^+\pi^-e^+e^-$, J. Adams et al., Phys. Rev. Lett. 80, 4123 (1998)

Search for the Decay $K_L \rightarrow \pi^0\nu\bar{\nu}$, J. Adams et al., Phys. Lett. B447, 240 (1999).

Observation of $\Xi^0 \rightarrow \Sigma^+e^-\bar{\nu}$, A. Affolder et al., Phys. Rev. Lett. 82, 3751 (1999).

Observation of Direct CP Violation in K_S, $K_L \rightarrow \pi\pi$ Decays, A. Alavi-Harati et al., Phys. Rev. Lett. 83, 22 (1999).

Measurement of the Decay $K_L \rightarrow \pi^0\gamma\gamma$, A. Alavi-Harati et al., Phys. Rev. Lett. 83, 917 (1999).

Measurement of the Branching Ratio of $\pi^0 \rightarrow e^+e^-$ Using $K_L \rightarrow 3\pi^0$ Decays in Flight, A. Alavi-Harati et al., Phys. Rev. Lett. 83, 922 (1999).

Light Gluino Search for Decays Containing $\pi^+\pi^-$ or $\pi^0\pi^0$ from a Neutral Hadron Beam at Fermilab, A. Alavi-Harati et al., Phys. Rev. Lett. 83, 2128 (1999).

Observation of CP Violation in $K_L \rightarrow \pi^+\pi^-e^+e^-$ Decays, A. Alavi-Harati et al., Phys. Rev. Lett. 84, 408 (2000).

Search for the Decay $K_L \rightarrow \pi^0\nu\bar{\nu}$ Using $\pi^0 \rightarrow e^+e^-\gamma$, A. Alavi-Harati et al., Phys. Rev. D61, 72006 (2000).

Search for the Weak Decay of a Lightly Bound H^0 Dibaryon, A. Alavi-Harati et al., Phys. Rev. Lett. 84, 2593 (2000).

Observation of the Decay $K_L \rightarrow \mu^+\mu^-\gamma\gamma$, A. Alavi-Harati et al., Phys. Rev. D62, 112001 (2000).

Search for the Decay $K_L \rightarrow \mu^+\mu^-$, A. Alavi-Harati et al., Phys. Rev. Lett. 84, 5279 (2000).

Study of the Decay $K_L \to \pi^+\pi^-\gamma$, A. Alavi-Harati et al., submitted to Phys. Rev. Lett. (2000).

Search for the Decay $K_L \to \pi^0 e^+ e^-$, A. Alavi-Harati et al., submitted to Phys. Rev. Lett. (2000).

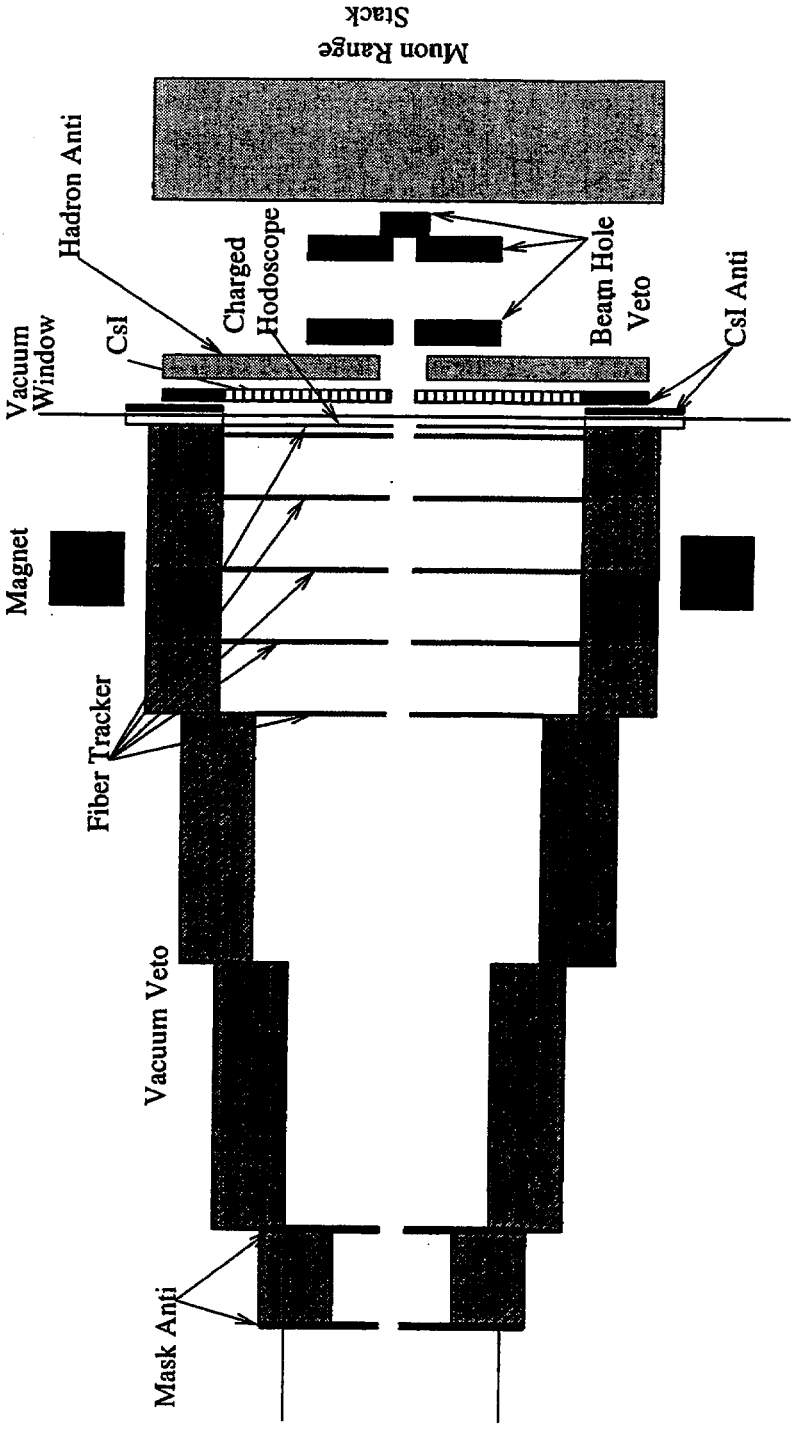
A Measurement of the Branching Ratio of $K_L \to e^+e^-\gamma\gamma$, A. Alavi-Harati et al., submitted to Phys. Rev. Lett. (2000).

First Observation of the Decay $K_L \to \pi^0 \to e^+e^-$, A. Alavi-Harati et al., submitted to Phys. Rev. Lett. (2000).

A Measurement of the Branching Ratio and Asymmetry of the Decay $\Xi^0 \to \Sigma^0\gamma$, A. Alavi-Harati et al., submitted to Phys. Rev. Lett. (2000).

E-804

KAMI DETECTOR LAYOUT



E-804 (Ray / Wah) KAMI R&D

Arizona, UCLA, Campinas (Brazil), Chicago, Colorado, Fermilab, IHEP/Protvino (Russia), Osaka (Japan), Rice, Sao Paulo (Brazil), Virginia

Status: *In Progress*

KAMI (KAons at the Main Injector) is a proposed fixed-target experiment designed to measure a wide variety of very rare kaon decays. By picking up where KTeV leaves off, KAMI expects to push the frontier of rare kaon decay physics into new territory beyond Standard Model sensitivities by taking advantage of the intense proton flux provided by the Main Injector.

The very rare kaon decays of greatest interest are $K_L \rightarrow \pi^0\nu\bar{\nu}$ and $K^+ \rightarrow \pi^+\nu\bar{\nu}$. In the context of the Standard Model, measurement of these two branching fractions can uniquely determine the two fundamental CP violation parameters of the model. These two parameters are referred to as ρ and η, where η directly sets the scale of CP violation within the model. In particular, the $K_L \rightarrow \pi^0\nu\bar{\nu}$ branching fraction is proportional to η^2 and provides a direct probe of CP violation within the Standard Model. Measurements in the system of B-meson decays may also be able to determine ρ and η uniquely. Comparison of ρ and η in the K and B systems provides a very powerful cross-check of our understanding of CP violation within the Standard Model.

The primary goal of the KAMI collaboration will be to detect the decay $K_L \rightarrow \pi^0\nu\bar{\nu}$, measure its branching ratio, and extract a value for η which is accurate to approximately 10%. Additionally, there are a number of other rare kaon decays of interest to the collaboration. Some of these decays are sensitive to direct CP violation, others probe critical regions of the Standard Model. Many of these decays are also sensitive to physics beyond the Standard Model.

To accomplish these goals, the existing KTeV detector will be modified in several significant ways, turning into the KAMI detector. The most significant upgrade will be the addition of a hermetic, highly efficient photon veto system lining the inside of the vacuum decay tank. These photon vetoes, made of lead and scintillator, are the key to reducing the $2\pi^0$ background to $\pi^0\nu\bar{\nu}$. In addition, the KTeV drift chambers, which have reached their rate limit, will be replaced by scintillating fiber tracking planes.

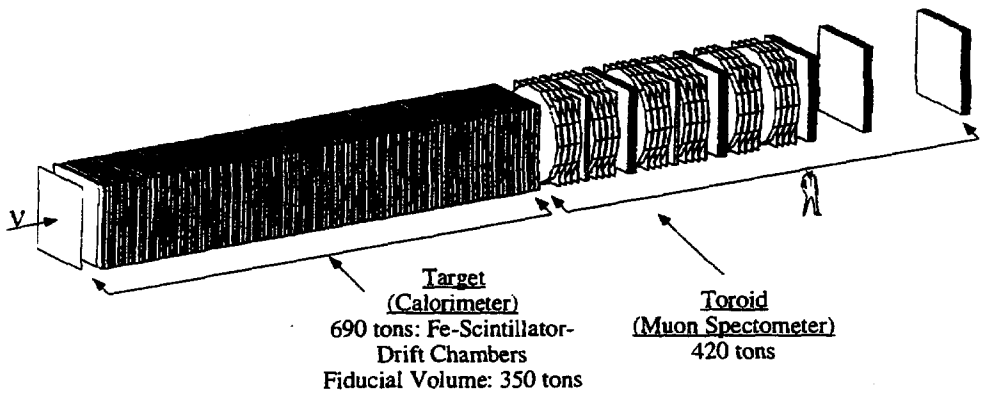
Two significant R&D efforts have been completed thus far. In 1999 a number of photon veto prototypes were exposed to a tagged photon beam in Japan to measure their inefficiency due to a mechanism known as photonuclear interactions. A photonuclear interaction, which occurs when a photon interacts with nuclei, can result in a final state which contains only neutrons. If the neutrons escape detection, an inefficiency results. The results from the beam test are very encouraging and demonstrate that the inefficiency from photonuclear interactions is under control.

In early 2000 the first KAMI beam test at Fermilab took place. Using the KTeV detector and 150 GeV protons from the Main Injector, the kaon and neutron fluxes were measured at three different targeting angles and with different amounts of beryllium absorber. The measured kaon flux is larger than originally expected and the measured ratio of kaons to neutrons is also larger than anticipated. Additionally, the measured kaon spectra were slightly higher in energy than originally expected. More energetic kaons result in more energetic photons which are easier to veto.

The response of a small lead-quartz calorimeter, known as the Back Anti (BA) was also measured during the beam test. The BA sits in the neutral beam and must detect high energy photons which pass through the beam hole of the CsI calorimeter. Because this detector is exposed to several hundred MHz of neutrons, it is necessary to make it efficient for photons but blind to neutrons. The analysis of this data is not yet complete.

The measured performance of prototype photon veto detectors as well as the measured flux and spectra of both kaons and neutrons under a variety of running conditions have been incorporated into our simulations, making them significantly more realistic than would be otherwise possible. These simulations are critical input in the process of writing a proposal for the experiment, which is our ultimate goal.

E-815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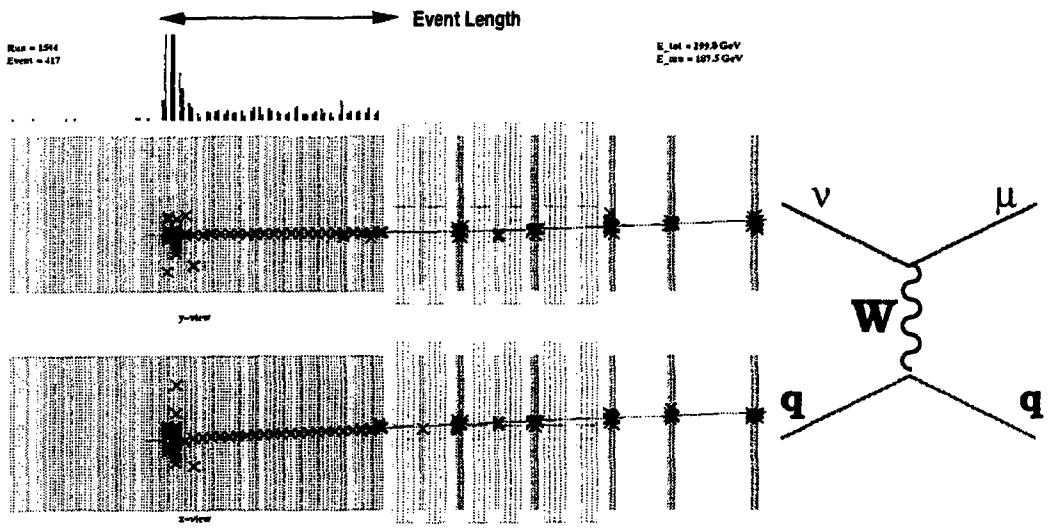
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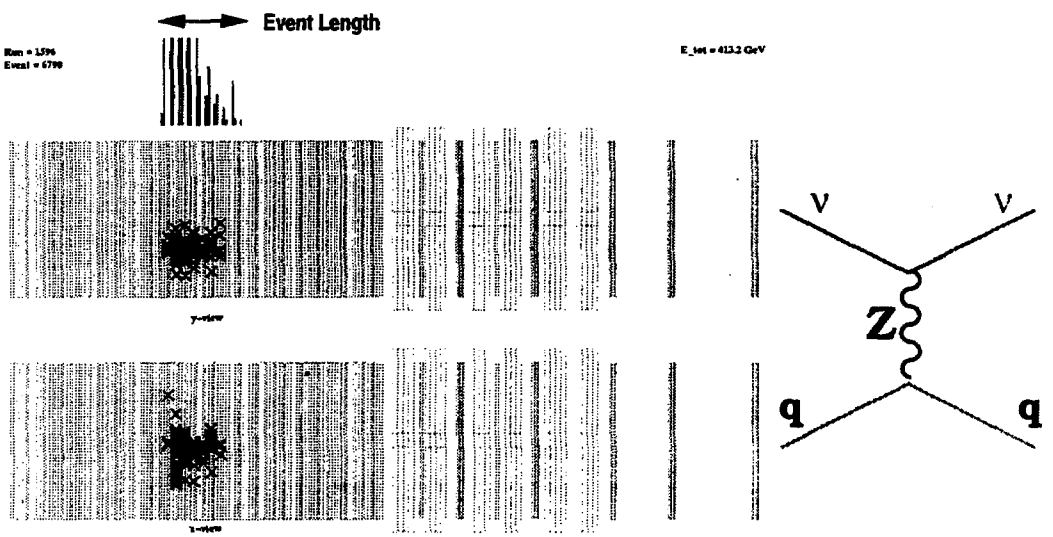
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E-815 (Bernstein / Shaevitz) Precision Neutrino / Antineutrino Deep Inelastic Scattering Experiment

Cincinnati, Columbia, Fermilab, Kansas State, Northwestern, Oregon, Rochester, Xavier

Status: *Data Analysis*

The NuTeV experiment is in the exciting position of being the only high-statistics neutrino experiment with separate extremely pure neutrino and antineutrino beams. During the 1996-97 fixed-target run we accumulated samples of 5×10^6 $\nu_\mu N$ and 1×10^6 $\bar{\nu}_\mu N$ interactions, allowing us to make important contributions toward understanding and measuring the parameters of the electroweak and strong interactions, and toward determining the strange and charm content of the nucleon. A test beam was targeted on NuTeV's calorimeter/spectrometer concurrently with the neutrino and antineutrino beams; this allowed an extremely precise determination of the detector's response to hadrons and muons of various energies. This calibration was crucial in permitting the NuTeV analysis projects to meet the precision challenge of our high-statistics data. Finally, because the region of the hall upstream of the main target calorimeter was instrumented, we have a large new window that we have used to search for exotic physics, such as neutral heavy leptons and the KARMEN anomaly.

Electroweak measurements/$\sin^2\theta_W$

Neutrino experiments have played a pivotal role in our improved understanding of the electroweak interaction. Early measurements of the neutral-to-charged current neutrino cross section ratio provided key input on the W and Z boson masses before their direct observation. Soon afterwards, the increasing precision of electroweak measurements allowed constraints on the mass of the top quark to be set before its direct measurement. Likewise today, precision measurements of electroweak parameters strictly limit the mass of the yet unobserved Higgs boson.

In particular, precision electroweak measurements from neutrino-quark scattering (e.g. the weak mixing angle) provide an indispensable complement to high-energy collider experiments because of their sensitivity to light quark couplings as well as physics beyond the standard model (including extra Z' bosons, neutrino oscillations, and quark compositeness).

Prior to NuTeV, the uncertainty on the world average of the weak mixing angle, $\sin^2\theta_W$, as measured from neutrino scattering data was dominated by a large correlated systematic uncertainty in charm production (namely, the charm quark mass). However, given the innovation of separate neutrino and antineutrino beams, NuTeV can measure the Paschos-Wolfenstein variable, Rminus, which is proportional to $\sin^2\theta_W$. By design,

since Rminus is a cross section difference, it is much less sensitive to charm production and many other theoretical uncertainties. With the inherent error cancellation of this new technique, NuTeV has reduced the uncertainty in $\sin^2\theta_W$ from charm production by a factor of eight, and has accumulated enough statistics to surpass its predecessor, CCFR. Preliminary results were presented in Moriond 1998; work on this analysis is nearly complete, and a final result is expected in early 2001. The preliminary result, which corresponds to a W mass measurement of 80.26 +/- 0.11 GeV/c^2, is dominated by its statistical uncertainty so only modest improvement in the error is expected with the final result. The agreement between the neutrino-derived and the direct-production mass attests to the success of the electroweak standard model over many decades in scale.

Dimuon and neutral current charm production

Having pure neutrino and antineutrino beams has enabled NuTeV to measure effectively the difference between neutrino and antineutrino neutral-current cross sections; we also can take advantage of these beams to study interactions in which there are two muons of opposite charge in the final state. One muon comes from the lepton vertex, where the charged-current interaction changes a neutrino into a muon; the other, from the decay of a charm particle, produced when the neutrino (antineutrino) interacts with a strange (antistrange) quark in the nucleon. This means that these events can be used to study both charm production and the strange content of the nucleon. NuTeV presented preliminary leading-order results on the size and shape of the strange sea at Moriond '99. Further study led to the assessment that estimates of the strange content of the nucleon depend heavily upon the model chosen to parameterize that content, and the choice was made to present the results of this analysis as tables of dimuon cross-sections. This document is currently under internal review; it is expected that it will be submitted for publication in early 2001.

In addition to producing charm through the charged current interaction, it should be possible to produce charm via the neutral current interaction. Exploiting the purity of the SSQT one can select single muon events where the muon is of the opposite lepton number expected from the neutrino beam. This sample has been used to set limits on Flavor-Changing Neutral-Current (FCNC) production of charm and bottom, and to measure the cross section for $\nu N \rightarrow c+\bar{c}+X$. No one has ever used neutrino scattering to limit FCNC and the use of neutrinos may be uniquely sensitive to certain types of Z's. This is the first measurement of the cross section for gluon-Z boson fusion production of a c-$\bar{c}$ pair. PRD has accepted an article on the FCNC limits and it should appear shortly. A paper on the cross section results is still under review by PRD, but we expect it will be published in early to mid 2001.

Structure functions and α_s

Still other measurements in neutrino physics that NuTeV will drastically improve are those of nuclear structure and the strong coupling

constant. Again because of the nature of the beams, we will ultimately be able to extend the kinematic reach of the structure function measurements. Since many future discoveries in this field are going to have to be made from proton-proton collisions, it is imperative that we understand in detail the proton's subconstituent content and characteristics, particularly of the anti-quark distribution at high fractional momentum (x). Neutrino interactions are the only channel to unravel the valence and sea parton distribution functions, and knowing them well at high x can make the difference between a discovery of new physics and simply confirming the Standard Model.

Just as electroweak measurements have become more and more precise, so have measurements of the strong coupling constant. Again, although the previous neutrino measurement of α_s was the most precise when first announced, improvements in NLO theory and lattice QCD have given the field even more precise measurements. Of course the most important aspect of α_s measurements is whether its evolution agrees over many values of momentum scale, so neutrino physics will have something to contribute regardless of the ultimate precision of any one technique. NuTeV expects to improve its measurement of α_s over its predecessors through an extremely thorough calibration program, which appeared in NIM in 2000. The uncertainty on the overall energy scale was the dominant systematic uncertainty on the previous neutrino α_s measurement, and NuTeV has improved this one uncertainty by almost a factor of three. Now that most of the calibration work is finalized, the structure function measurements are in full swing.

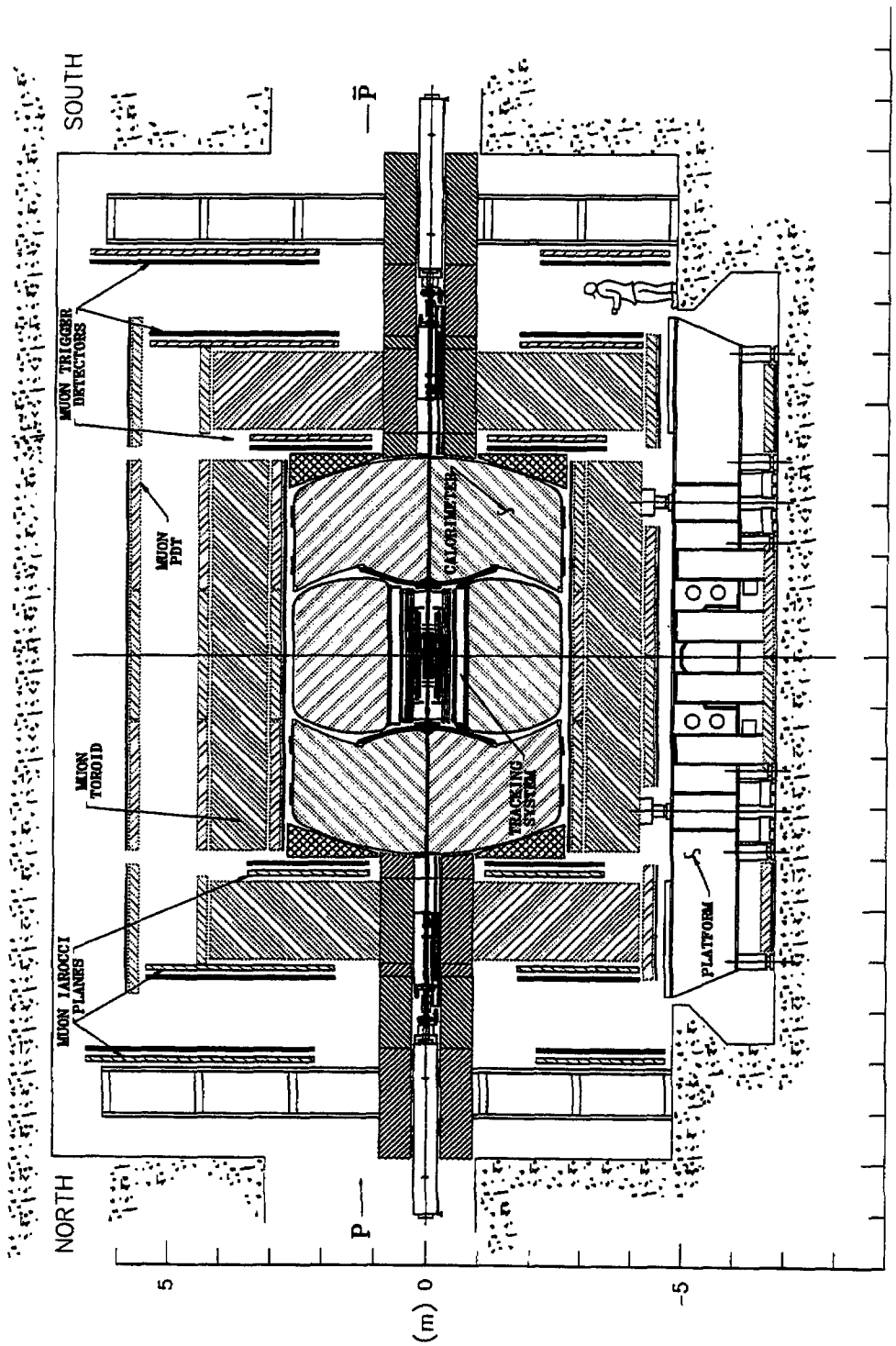
Neutral heavy leptons

Finally, the instrumentation of the upstream region of the experimental hall has allowed NuTeV to search competitively for weakly-interacting neutral particles produced in either pion or kaon decays. Interactions (i.e. decays) occurring in the 34 m upstream of the neutrino target can now be identified in a series of drift chambers, and the background was kept to a minimum by filling the remainder of the decay region with helium bags. Because the neutrino target itself provides particle identification, searches can be made of a variety of exotic particles which may be expected to decay into very different final states.

For example, we have completed a search for neutral heavy leptons which decay to at least one muon in the final state, published in PRL in 1999. We have also published a search for a 33.9 MeV particle which decays into an e^+e^- final state. This particle has been proposed to account for the timing anomaly found in the KARMEN data. NuTeV ruled out a large region of phase space that is implied by the KARMEN data. This past year we presented a preliminary search for a high mass, rarely interacting, neutral particle decaying into a final state with one muon and one other charged particle. This search found three events with an extremely small expected background. No Standard Model process has been found to explain these events. We are working to finalize this search and expect to publish in early 2001. Still more

searches can and are being performed, taking advantage of the very large data sample as well as our good understanding of the neutrino beam and target.

Although the measurements listed above are most of what make NuTeV an exciting experiment of which to be a part, there are still other topics that have not been covered that also contribute. We are improving our techniques to look for neutrino oscillations, so that even if NuTeV cannot access the region of phase space that is currently expected to produce oscillations, we are paving the way for future steel-scintillator oscillation experiments (e.g. MINOS). Also, NuTeV's neutrino beam purity is so high that we will also be able to look for lepton number violating transitions such as $\nu_\mu \rightarrow \bar{\nu}_\mu$. The success of our data-taking run is evident in both the depth and breadth of physics issues that are being addressed.



Side view of the DØ detector for Run II

E-823 / 908 / 740 (Weerts / Womersley) Study of Events in $\bar{p}p$ Collisions at 2 TeV in the D0 Detector

Acad. Sci. (Czech Rep.), Amsterdam/NIKHEF (Netherlands), los Andes (Colombia), Arizona, BNL, Boston, Brown, Buenos Aires (Argentina), UC/Irvine, UC/Riverside, CBPF (Brazil), Charles (Czech Rep.), CSU/Fresno, Czech Tech (Czech Rep.), CINVESTAV (Mexico), Columbia, Delhi (India), Estadual Paulista (Brazil), Fermilab, Florida State, Grenoble (France), IHEP/Beijing (China), IHEP/Protvino (Russia), Illinois/Chicago, Imperial College (United Kingdom), Indiana, INP/Krakow (Poland), Iowa State, ITEP (Russia), JINR (Russia), Kansas, Kansas State, Lancaster (United Kingdom), Langston, LBNL and UC/Berkeley, LMU Munich (Germany), Louisiana Tech, Mainz (Germany), Manchester (United Kingdom), Marseille (France), Maryland, Michigan, Michigan State, Moscow State (Russia), Nebraska, Nijmegen (Netherlands), Northeastern, Northern Illinois, Northwestern, Notre Dame, Oklahoma, Orsay (France), Panjab (India), Paris VI and VII (France), PNPI (Russia), Rice, Rio de Janeiro (Brazil), Rochester, Saclay (France), San Francisco de Quito (Ecuador), SUNY/Stony Brook, Tata (India), Texas/Arlington, Virginia, Washington

Status: *E-740 - Data Analysis*
E-823 - No Data Yet
E-908 - No Data Yet

The D0 detector is a large, hermetic 4π detector for the study of proton-antiproton collisions with a center-of-mass energy of 2.0 TeV at the Fermilab Tevatron Collider. The detector stresses identification of leptons, photons, jets and missing transverse energy for high-p_T physics. D0 is an international collaboration representing the efforts of over 450 physicists and Ph.D. students from 65 institutions whose goal is to study a diverse range of particle physics topics. The Run I D0 experiment (E-740) successfully completed data-taking in 1996, amassing ~120 pb^{-1} of data at $\sqrt{s}$ = 1800 GeV, including a small fraction at 630 GeV.

The D0 Run II detector proposal (E-823) has been approved and represents a major upgrade of the Run I detector. The detector must operate at instantaneous luminosities near $2\times10^{32}cm^{-2}s^{-1}$ with bunch spacings as short as 132 ns. To meet the challenges of such a high-rate environment, the entire central tracking system is being replaced with a silicon microvertex detector, a scintillating-fiber tracker, a solenoid magnet, and central and forward preshower detectors. The new tracking detectors will provide enhanced pattern recognition and triggering opportunities for lepton, photon and jet final states. The entire Run II physics menu will be significantly enhanced by the new detectors.

The silicon microvertex detector (SMT) consists of 792,000 channels and subtends an active area of 4.7 m^2. It will provide precise tracking in the region $|\eta| < 3$. The silicon tracker consists of silicon disks and barrels formed into six disk/barrel modules. Each barrel module consists of four (radial) layers of detector ladder assemblies which provide coverage for large angle tracks.

Three-dimensional reconstruction of tracks at forward rapidities is performed using the disks. The SMT was constructed at the Fermilab Silicon Detector Facility and installed in D0 in late 2000.

The central scintillating-fiber tracker (CFT), an innovative design based on visible light photon counters, is also currently in production. The fiber tracker consists of 72,000 835-micron fibers arranged into eight radial layers. It will provide an off-line momentum measurement for charged particles with $|\eta| < 2$ and fast trigger information for tracks with $|\eta| < 1.6$. The single-channel noise rate, quantum efficiency and photo-electron yield all meet design specifications. Combining fiber and silicon tracker information will provide a charged-particle momentum measurement with a resolution of $\Delta p/p = 2\%$ at $p_T = 1$ GeV/c degrading to 10-18% for central 100 GeV/c tracks. The superconducting solenoid magnet has been successfully installed, tested and mapped at its design field of 2.0 Tesla. Sandwiched between the solenoid and central calorimeter is the central preshower detector (CPS) which was installed simultaneously with the solenoid. The central preshower consists of 7280 channels of 6.6 mm scintillating triangular fibers and will enable efficient triggering on electrons and photons in a high-rate environment. Separate forward preshower detectors enhance electron and photon triggering for the region $1.5 \leq |\eta| \leq 2.5$.

The tracking detectors are surrounded by a hermetic liquid argon sampling calorimeter with uranium and copper/steel absorber. The calorimeter is contained in three cryostats (a central barrel and two endcaps). The calorimeter is compensating ($e/\pi \sim 1.05$) and finely segmented to identify electrons, photons, muons, and jets. The electromagnetic (EM) calorimeter covers $|\eta| < 3$ and hadronic calorimetry extends to $|\eta| < 4.4$; the large acceptance provides excellent measurement of the missing transverse energy. The segmentation in $\Delta\eta \times \Delta\phi = 0.1 \times 0.1$ (0.05×0.05 at EM shower maximum); for Run I, the energy resolution was $\sim 15\%/\sqrt{E}$ for electrons and photons (with a small constant term) and $\sim 85\%/\sqrt{E}$ for jets. The calorimeter readout electronics has been upgraded to a switched capacitor array design and the shaping times have been re-optimized to cope with shorter beam crossing.

Outside the calorimeter cryostats is the upgraded muon tracking system. An independent measurement of the muon momentum will be performed in the magnetized iron toroids using planes of mini-drift tubes in the forward region and proportional drift tubes in the central region. Fast muon triggering will be achieved using layers of scintillator trigger counters which can be combined with fiber tracker information to enable triggering on low p_T (≥ 1.5 GeV/c) muons.

The upgraded D0 detector contains approximately one million channels. The data readout is initiated by a multi-level trigger with each level having increased complexity and decision time. The Level 1 trigger is designed for an accept rate of 10 kHz. Calorimeter-based triggers utilize analog hardware to compute fast energy sums to identify localized electromagnetic and hadronic activity and the presence of missing E_T. Track finding in the CFT will be

performed by a massively parallel application of field programmable gate arrays; electron candidates can be selected using azimuthal matching between the CFT and CPS. Quadrant level matching between the preshowers and calorimeter can also be performed at Level 1.

The Level 2 trigger with a 1 kHz accept rate will enable more sophisticated reconstruction and will fully exploit correlations between the tracking detectors, calorimeter and muon systems; for example η - ϕ matching between the preshower and calorimeter. The Level 2 trigger capability will be supplemented by a Silicon Track Trigger (E-908). This device will permit the trigger to discriminate on tracks measured using the silicon microvertex detector which do not emanate from the primary vertex. Such tracks are efficient indicators of heavy flavor, i.e. b and c quark production. This will greatly enhance the triggering capabilities for Higgs bosons, top and bottom (s)quarks. It will also enable triggering on $Z \rightarrow b\bar{b}$, which is a key calibration channel for top and Higgs physics. The STT proposal was approved in early 1999. Design work is proceeding with a view to installation shortly after commissioning the rest of the E-823 detector.

The Level 3 trigger will be a commodity-based PC farm running under Windows NT. The availability of fully digitized information will permit sophisticated software reconstruction algorithms to be applied. The Level 3 accept rate will be 5-10 Hz.

Although the Run I data-taking is complete, there is still significant activity in the Run I physics program. The Top Quark Group was able to set a mass limit of $m_t > 131$ GeV/c^2 using Run Ia data. Utilizing the larger Run Ib data set, D0 reported observation of the top quark in February 1995. This represented a major accomplishment in understanding the Standard Model. The top quark mass has been measured in lepton + jet and dilepton topologies. In 1997, a combined measurement of $172.0 \pm 5.1 \pm 5.5$ GeV/c^2 was reported. Subsequently the $t\bar{t}$ cross section has been measured in the all-jet final state. In 1999, D0 published upper limits for the production of charged Higgs bosons in top quark decays. Current efforts include searches for evidence of single top production and identification of the $t\bar{t}$ to all-jet final state using electron tags.

The QCD Group has presented cross sections for inclusive jets in the forward and central regions and differential cross sections for dijet production. The dijet angular distributions have been measured, and isolated photon cross sections and angular distributions presented. Evidence for colorless exchange, e.g. pomerons, from rapidity gaps between forward and backward jets has been presented. Recent publications include the measurement of the dijet mass spectrum with limits on quark compositeness. Current Run I efforts include jet measurements using the $k_\perp$ recombination scheme, inclusive jet cross sections as a function of rapidity and $\sqrt{s}$, the triple differential jet cross section and BFKL studies using jets widely separated in rapidity.

The Electroweak Group focused on the production and decay of W and Z bosons. Using Run I data, the mass of the W boson has been measured and published: $m_W = 80.482 \pm 0.091$ GeV/c^2. This improved measurement utilizes large rapidity electrons in combination with previous results based on the central region. In 1999, an improved measurement of $\Gamma w = 2.152 \pm 0.066$ GeV was reported. The production of dibosons ($W\gamma$, $Z\gamma$, WW, WZ) via the trilinear gauge couplings provides a compelling test of the Standard Model. D0 has published limits on possible anomalous contributions for all these processes. The production of a vector boson in association with jets provides an interesting laboratory for QCD. D0 has reported evidence of color coherence in W + jets. The inclusive differential cross section for Z bosons as a function of p_T has been measured, providing a test of resummation techniques.

The New Phenomena Group conducted searches for physics beyond the Standard Model. Limits on the production cross sections for leptoquarks, W', Z', and right-handed W's have been set. Evidence for supersymmetry has been actively sought for: mass limits and cross section limits have been set for squarks, gluinos and gauginos in SUGRA, Gauge Mediated and R-parity violating scenarios. In 1999, mass limits on nonstandard Higgs bosons decaying to photons were published. Mass limits were placed on second generation leptoquarks. Searches for technicolor and signatures of large extra dimensions are ongoing.

The B-Physics Group has obtained cross sections for low p_T muons, inclusive b and J/ψ production. Angular correlations and cross sections for $b\bar{b}$ have been reported. The b quark fragmentation function has been measured using muons within jets. Investigation of the central and inclusive b cross section at $\sqrt{s} = 630$ GeV is in progress.

Building on this foundation, the Run II physics program is a rich and diverse one. The top quark physics program will evolve from the limited initial investigations of Run I to the realm of precision physics. The large top quark mass suggests a unique role in electroweak symmetry breaking; a precise knowledge of its mass is also critical to computing radiative corrections in the Higgs sector. Run II will enable a 3 GeV/c^2 top quark mass measurement. The CKM matrix element $|V_{tb}|$ will be directly determined. The structure of the Wtb vertex will be probed by determining the ratio of longitudinal to left-handed W's produced in top quark decays. The observation of single top production will provide a measurement of the top quark width and an independent measurement of $|V_{tb}|$. Tests of lepton universality in top decays could signal the production of non-standard particles such as charged Higgs bosons or supersymmetric particles. The $t\bar{t}$ invariant mass distribution could reveal new phenomena related to electroweak symmetry breaking.

In electroweak physics, the W mass and width measurements will remain important goals. From Run I extrapolations, the expected W mass error is 40 MeV per lepton channel. Combining the W mass with a precise measurement of the top quark mass will enable an indirect measurement of the Higgs boson mass to 50%. The Z boson forward-backward asymmetry will

provide a measurement of $\sin^2\theta_W$ for light quarks and provide further constraints on parton distribution functions. The study of the trilinear gauge boson couplings will continue benefitting from increased integrated luminosity. Rapidity correlations in $W\gamma$ production provide a unique test of the gauge structure of the Standard Model. It will also be possible to probe the quartic gauge couplings via $W\gamma\gamma$ and $WW\gamma$ production. Precise knowledge of the WW and WZ production cross sections will be a key ingredient in searches for new phenomena, in particular the Higgs boson.

Run II will also allow extensive tests of QCD. The jet cross section will be extended to higher transverse energies, enabling the high-x gluon distribution in the proton to be pinned down. The low-E_T behavior of the jet and photon cross sections will help us understand soft gluon radiation effects. The large statistics available in Drell-Yan and vector boson-plus-jet samples will enable precise tests of parton distributions, color coherence and resummation models. The observed b-quark cross section remains significantly in excess of predictions, and additional measurements will hopefully shed some light on this issue. The new forward proton detectors (E-900) will allow us to trigger on, and tag, diffractive events; combining these detectors with an observation of the rest of the event in the D0 detector will allow us to probe the nature of hard diffraction and the pomeron, if it exists, in new and incisive ways.

The B physics program will be fruitful. Observation of CP violation in the neutral B meson system, in particular the measurement of $\sin(2\beta)$, will be a major goal. Measurement of the B_s^0 oscillations frequency, which has remained elusive, will be performed. Precise lifetime and mass measurements of the B_c meson will provide tests of heavy quark effective theory and non-relativistic QCD.

A key aspect of the Run II physics program will be the search for new physics phenomena. Theoretically, perhaps the most attractive extension to the Standard Model is supersymmetry. Naturalness arguments suggest gaugino masses will be accessible in Run II. Extended gauge theories predict new U(1) symmetries with an associated Z' boson. Run II will probe Z' masses up to 1 TeV with similar sensitivity for W'. For new particles strongly produced, e.g. technihadrons, Run II will significantly improve current limits.

The ultimate goal of the Run II physics program will be the quest for the Higgs boson. Precision electroweak measurements and theoretical constraints strongly suggest that one or more Higgs bosons will be observable at the Tevatron. For 10 fb^{-1}, it will be possible to exclude the Standard Model Higgs boson up to a mass of 185 GeV/c^2 and cover much of the minimal supersymmetry parameter space. Extraction and understanding of any Higgs boson signal will rely on the detailed understanding gained from performing the core of the Run II physics program.

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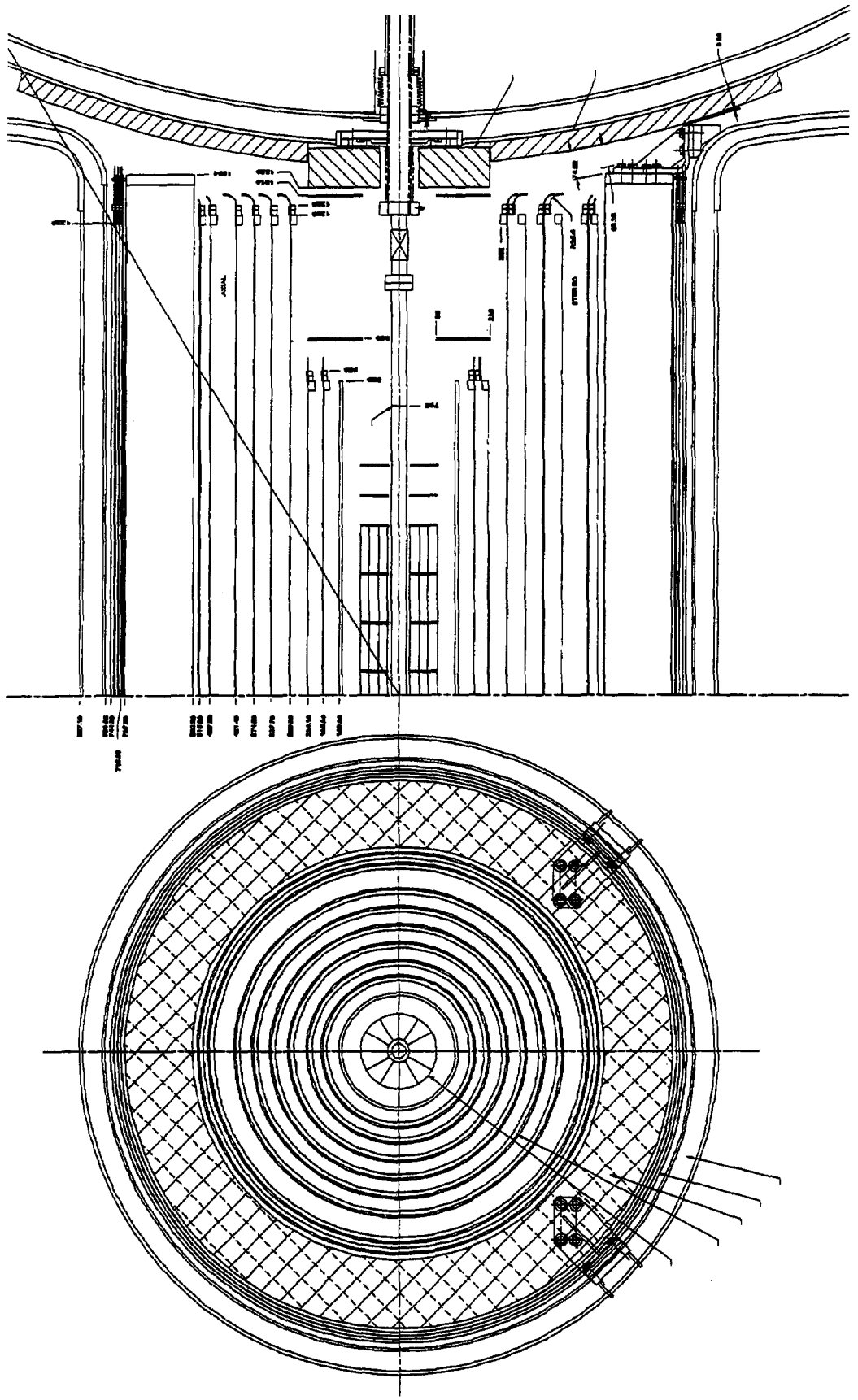
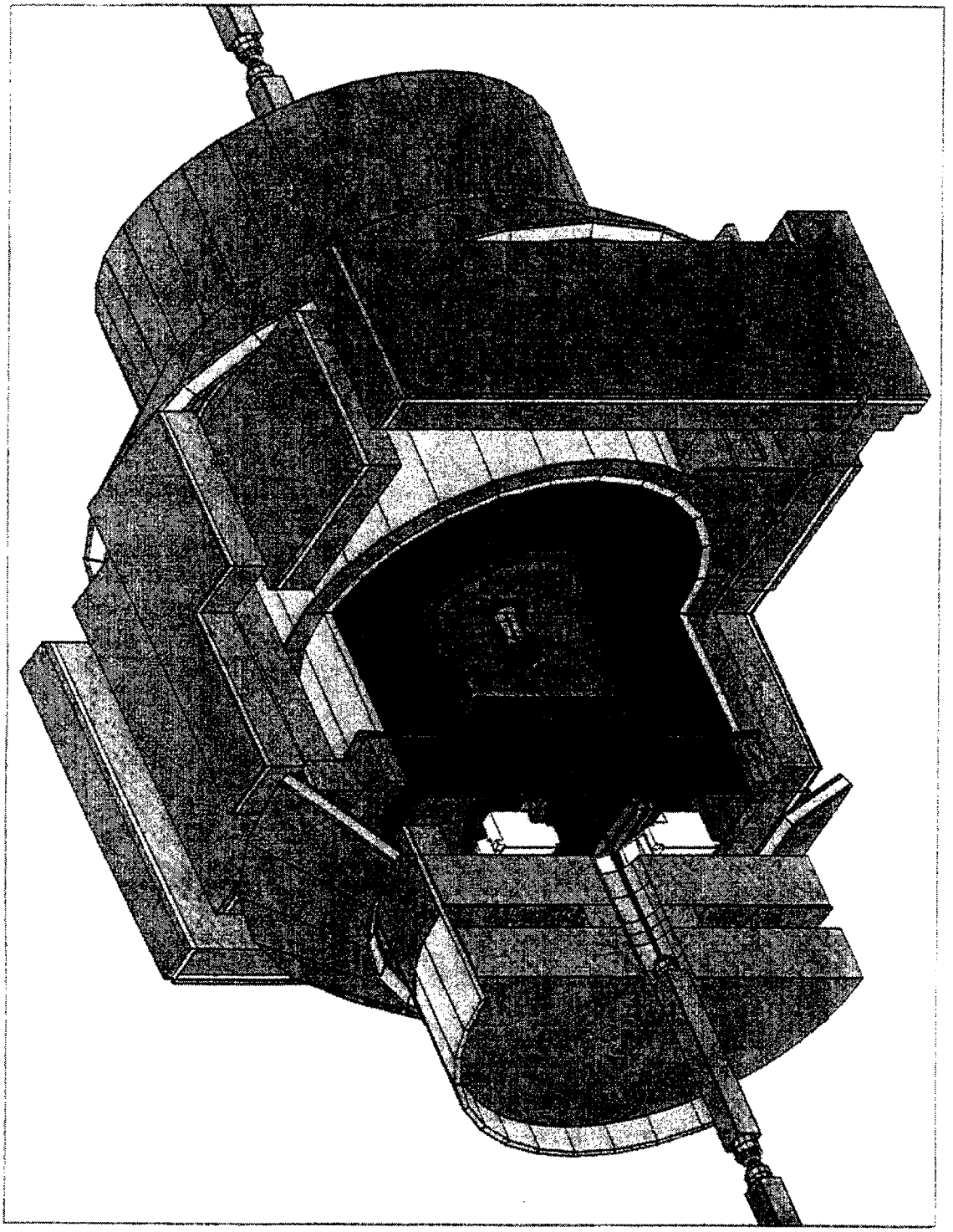


The Run II configuration of the tracking system. Shown are the central silicon vertex tracker, the central scintillating fiber tracker, and the central and forward preshower detectors.



E-830

E-830 / 909 / 916 / 775 (Bedeschi / Goshaw) Collider Detector at Fermilab

Academia Sinica (Taiwan), ANL, Bologna (Italy), Brandeis, UC/Davis, UCLA, Cantabria (Spain), Carnegie Mellon, Chicago, Duke, Fermilab, Florida, Frascati (Italy), Geneva (Switzerland), Glasgow (United Kingdom), Harvard, Hiroshima (Japan), Illinois, Inst. of Particle Phys. (Canada), ITEP (Russia), JINR (Russia), Johns Hopkins, Karlsruhe (Germany), KEK (Japan), Korea Hadron Coll. Lab. (Korea), LBNL, Liverpool (United Kingdom), Michigan, Michigan State, MIT, New Mexico, Northwestern, Ohio State, Okayama (Japan), Osaka City (Japan), Oxford (United Kingdom), Padova (Italy), Pennsylvania, Pisa (Italy), Pittsburgh, Purdue, Rochester, Rockefeller, Rome (Italy), Rutgers, Texas A&M, Texas Tech, Trieste/Udine (Italy), Tsukuba (Japan), Tufts, Univ. Coll. London (United Kingdom), Waseda (Japan), Wisconsin, Yale

Status:	*E-775 - Data Analysis*
	E-830 - No Data Yet
	E-909 - No Data Yet
	E-916 - No Data Yet

The Collider Detector at Fermilab (CDF) is a general purpose detector system designed to explore the physics of 2 TeV proton-antiproton collisions at the Fermilab Tevatron Collider.

The heart of the CDF central detector is a 5.0-meter-long, 1.5-meter-radius, 1.4 Tesla superconducting solenoid with tracking systems in the magnetic field for momentum analysis of charged particles. In the detector which operated until the spring of 1996, the solenoid was surrounded by scintillator-based calorimeters in the central region covering the angular range 30^{o} to 150^{o} with respect to the Tevatron beams, and two "plug" gas calorimeters in the ends of the solenoid extending the calorimeter coverage down to 10^{o}. In all regions the calorimeters are divided into electromagnetic and hadronic sections and have a projective tower geometry to measure energy flow in fine bins of pseudorapidity and azimuth. Muon chambers are located behind the calorimeters. In the forward directions for angles below 10^{o} and down to 2^{o} are additional electromagnetic and hadronic gas calorimeters. The muon detector system in the forward direction includes magnetized iron toroids for momentum measurement. The original detector has approximately 100,000 channels of electronics read out via a FASTBUS data acqusition system. A three-level trigger system selects events to be recorded on magnetic tape.

CDF as E-775

E-775 is the upgraded version of CDF for Collider Runs Ia and Ib. For Run Ia the highlights of the upgrade included:

1. The addition of a 4-layer, 46,000 channel silicon microstrip vertex detector, the SVX. This device was installed around a new 1.5 inch diameter beam pipe and enabled the reconstruction of secondary

vertices, opening up a new field of precise b physics measurements and b-tags for top quark identification.

2. A new set of time-projection chambers with 4 cm drift spaces replacing the old 15 cm drift devices in order to cope with higher luminosity.

3. The muon coverage was considerably improved by:

   a) new chambers and scintillators (CMX) to extend the coverage from pseudorapidity of 0.6 to 1.0; and

   b) additional steel and new chambers to drastically improve the punchthrough background in the central region.

4. New front-end electronics were added to the gas calorimeters and tracking chambers to cope with higher luminosity. These allowed lower gas gain operation and improved noise performance. The outer regions of the CTC were also equipped with dE/dx readout.

5. The throughput of the data acquisition was considerably improved by adding new event builders and more computing power in Level 3. As a result the output to tape increased from 1.2 to 8 Hz.

6. The offline environment was improved by adding 1000 Mips to the farms and acquiring a 1.2 Tbyte robotic storage device.

For Run Ib, the upgrades included:

1. A new radiation-hard Silicon Vertex Detector.

2. The DAQ bandwidth was increased by adding VME-based scanners and an Ultranet hub to connect the readout scanners to the Level 3 processors.

3. New Level 2 processors were installed to increase the speed, flexibility, and power of the trigger.

4. A diffractive spectrometer featuring Roman pots was added.

In Collider Run Ia, CDF rolled into the B0 Collision Hall at the end of March 1992, and the first collisions were seen in May 1992. During Run Ia, the E-775 detector functioned well, taking data at luminosities up to $9\times10^{30}cm^{-2}sec^{-1}$ with 90 percent livetime and an overall data-taking efficiency of 71 percent. A total data sample of 21.4 pb^{-1} was collected by the end of the run in June 1993.

During Collider Run Ib, the detector has continued to function well, taking data at luminosities up to $\sim20\times10^{30}cm^{-2}sec^{-1}$ with 90 percent livetime and an overall data-taking efficiency of about 80 percent. Data-taking began on January 19, 1994, and by February 20, 1996, a total integrated luminosity of $\approx$90 pb^{-1} had been recorded.

The CDF Collaboration has increased dramatically in size since 1989. Thirty-eight new institutions have joined, bringing the total to 55 representing 11 countries. A total of more than 475 physicists are now members, up from 187 in 1989.

A total of 218 papers on CDF results have been published or submitted, and 206 students have written theses on CDF analyses. Some highlights of the Run I physics program include:

1. First evidence of top quark production followed by discovery (simultaneously with D0) of the top quark. After the discovery, measurements of top quark mass, production and decay properties rapidly followed.

2. World-class measurements of the spectroscopy and lifetimes of b quark states, including the discovery of the B_c, mixing, and CP violation measurements in the $B_0\bar{B}_0$ sector.

3. Measurement of W mass and width, triboson couplings, and Drell-Yan cross section.

4. Observation of excess over QCD calculations of very high E_T jet production, and other QCD measurements in jet physics, photon physics, and diffractive phenomena.

5. New limits on SUSY particles, Higgs boson, leptoquarks, new gauge bosons, and other exotic states.

CDF as E-830

E-830 (also known as CDFII) is the upgraded version of CDF for Collider Run II where the bunch spacing will be as small as 132 ns and the luminosity in excess of $2\times10^{32}cm^{-2}sec^{-1}$. The full scope of the upgrade is described in the Technical Design Report (TDR), available as a Fermilab publication. The highlights include:

1. Replacing the gas calorimeters with scintillating tile-based plug calorimeter extending to $|\eta|$ of 3.

2. Replacing the SVX with a five-layer, double-sided SVXII that covers the entire luminous region.

3. Adding two additional layers of silicon detectors (ISL) at larger radii. The combination of the SVXII and ISL will allow precise 3D tracking out to $|\eta|$ of 2.

4. Replacing the CTC with a smaller drift cell version, the COT, which will reduce the drift time to less than the 132 ns bunch spacing.

5. Replacing all the front-end electronics to cope with the shorter bunch spacing. The principal elements include:

   a) pipelined front ends and buffering for L2 decisions resulting in virtually deadtimeless operation; and

   b) new ASICs for ADCs and TDCs.

6. New trigger system comprising:

   a) all digital trigger;

   b) new track processor allowing high resolution tracking decisions in L1; and

   c) Level 2 trigger based on SVXII to allow secondary vertex triggers at L2.

7. Extended muon coverage out to $|\eta|$ of 1.5 including:

   a) new counters and chambers on the muon toroids now moved closer to the interaction region;

   b) new counters covering the region just outside the CMX; and

   c) covering missing azimuthal regions in the CMX and central muon coverage.

8. New DAQ components with higher throughput at all levels.

9. Extended offline environment that includes:

   a) code migration toward object-oriented models;

   b) data handling to cope with petabyte-scale datasets; and

   c) enhanced computing power in farms.

With the 2 fb^{-1} expected for Run IIa, the anticipated physics program is truly exciting and features:

1. Top quark mass, production, and decay measurements at the few percent level.

2. Observation of CP violation in the b quark sector.

3. Precision mass, lifetime, and spectroscopy measurements of b quark states including B_s mixing and B_c properties.

4. W mass measurement to better than 40 MeV.

5. Jet and photon measurements out to very high E_T.

6. Searches for SUSY particles, Higgs bosons, and other exotic states.

Run II is expected to begin on March 1, 2001.

CDF as E-909

E-909 is a proposal to upgrade the baseline E-830 experiment with the following detectors:

1. An additional single-sided silicon microstrip detector layer positioned very closed (R ~1.5cm) to the beamline.

2. A time-of-flight (TOF) detector consisting of 216 scintillator bars located between the COT and the solenoid.

With the inclusion of these new detectors, CDF will significantly increase its physics reach in the area of CP violation in the B sector and B_s mixing. These proposals received Stage II approval by the Fermilab Director in 1999.

CDF as E-916

E-916 is a proposal for a diffractive physics program at CDF. The upgrades for this physics include beam shower counters, a Roman pot detector, and mini-plug calorimeters. This proposal was presented to the Fermilab Director and Physics Advisory Committee (PAC) in November 1999 and received Stage I approval by the Fermilab Director in July 2000.

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Theses

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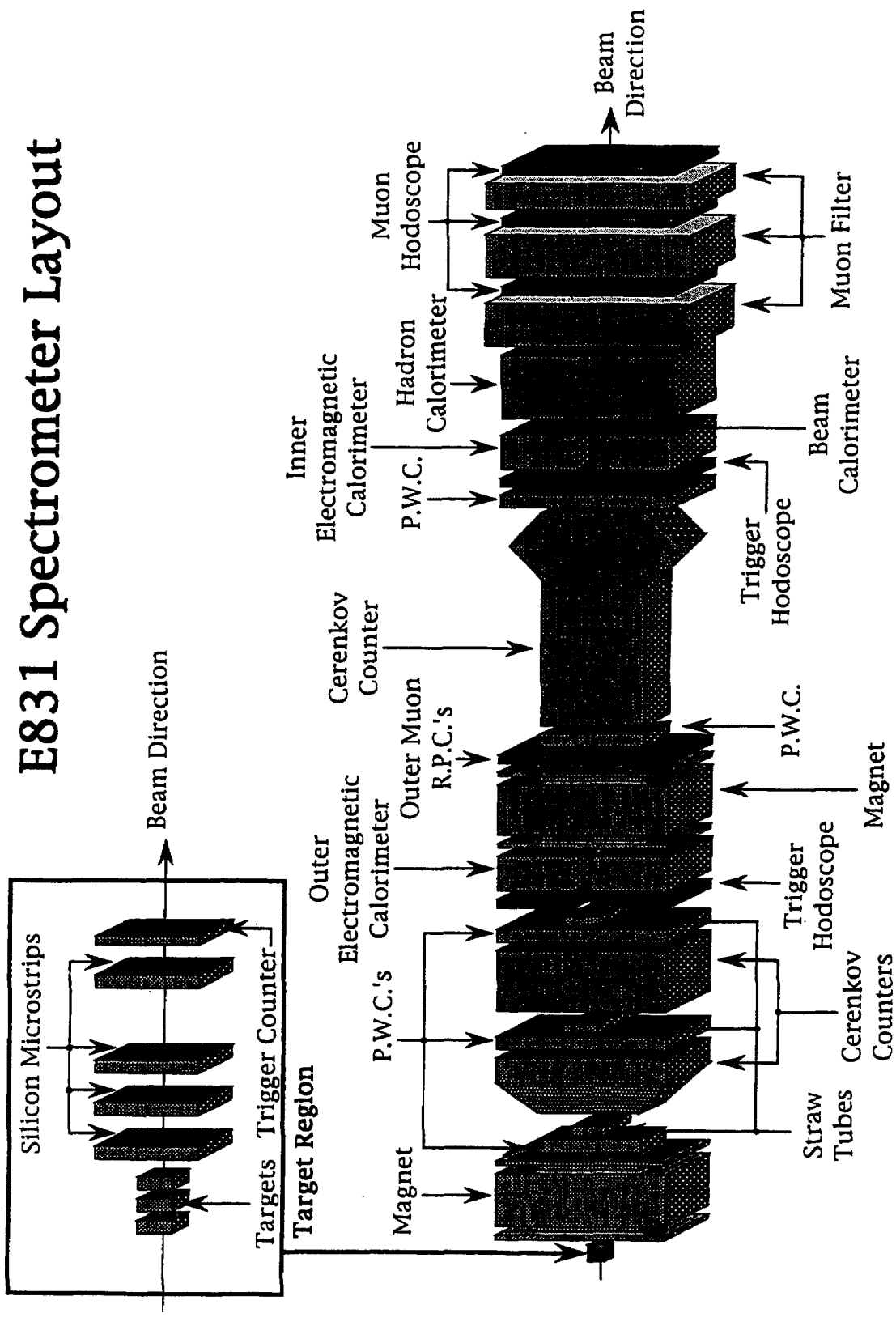
E831 Spectrometer Layout
Beam Direction
Silicon Microstrips
Targets
Trigger Counter
Target Region
Magnet
P.W.C.'s
Outer Electromagnetic Calorimeter
Outer Muon R.P.C.'s
Cerenkov Counter
Inner Electromagnetic Calorimeter
P.W.C.
Hadron Calorimeter
Muon Hodoscope
Beam Direction
Muon Filter
Beam Calorimeter
Trigger Hodoscope
P.W.C.
Magnet
Trigger Hodoscope
Cerenkov Counters
Straw Tubes

E-831 (Cumalat / Moroni) A High Statistics Study of States Containing Heavy Quarks Using the Wideband Photon Beam and the E-687 Multiparticle Spectrometer

UC/Davis, CBPF (Brazil), CINVESTAV (Mexico), Colorado, Fermilab, INFN/Frascati (Italy), Illinois/Champaign, Korea (Korea), INFN/Milano (Italy), Milano (Italy), North Carolina, INFN/Pavia (Italy), Pavia (Italy), Puebla (Mexico), Puerto Rico/Mayaguez, South Carolina, Tennessee, Vanderbilt, Wisconsin, Yeonsei (Korea)

Status: *Data Analysis*

E-831 (FOCUS) is a high-intensity photoproduction experiment that is designed to study the production and decay of charmed particles. The experiment enjoyed a successful data-taking period during 1996 and 1997. The spectrometer has excellent particle identification with three Cerenkov counters, two electromagnetic calorimeters, and several scintillator arrays for muon detection. A scintillating fiber calorimeter is used to identify neutrons and to determine the energy of the hadronic event. The vertex region contains segmented BeO targets interleaved with silicon strip detectors. The vertex region is followed by 12 planes of silicon strip detectors.

The physics of the experiment involves high-precision studies of D semileptonic decays with an emphasis on the determination of form factors and CKM matrix elements $|V_{cd}|$ and $|V_{cs}|$, QCD studies of Double D events, a measurement of the absolute branching fraction for the D^0 meson, searches for D^0 mixing using hadronic and semileptonic final states, and searches for CP violation, rare and forbidden decays, fully leptonic decays of the D^+, and a systematic investigation of charm baryons and their lifetimes.

In 2000 we published three papers and we submitted a fourth paper to Physical Review Letters. Two of the papers bear on the phenomenology of D^0-$\bar{D}^0$ mixing, one on a search for CP violation in D^0 and D^+ decays, and one on the mass splittings between the charm baryons Σ_c^0 and Σ_c^{++0}.

The first six figures on the following pages represent the highlights from these papers. The seventh figure presents evidence for doubly Cabibbo suppressed D^+ decays and singly Cabibbo suppressed D_s^+ decays.

Publications

A Measurement of Lifetime Differences in the Neutral D-meson System, Phys. Lett. B485, 62 (2000).

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A Study of the Decay $D^0 \to K^+\pi^-$, submitted to Phys. Rev. Lett. December 2000.

Theses

E. Vanndering, University of Colorado, January 2000.
P. Dini, University of Milan, January 2000.
A. Rahimi, University of Illinois, June 2000.

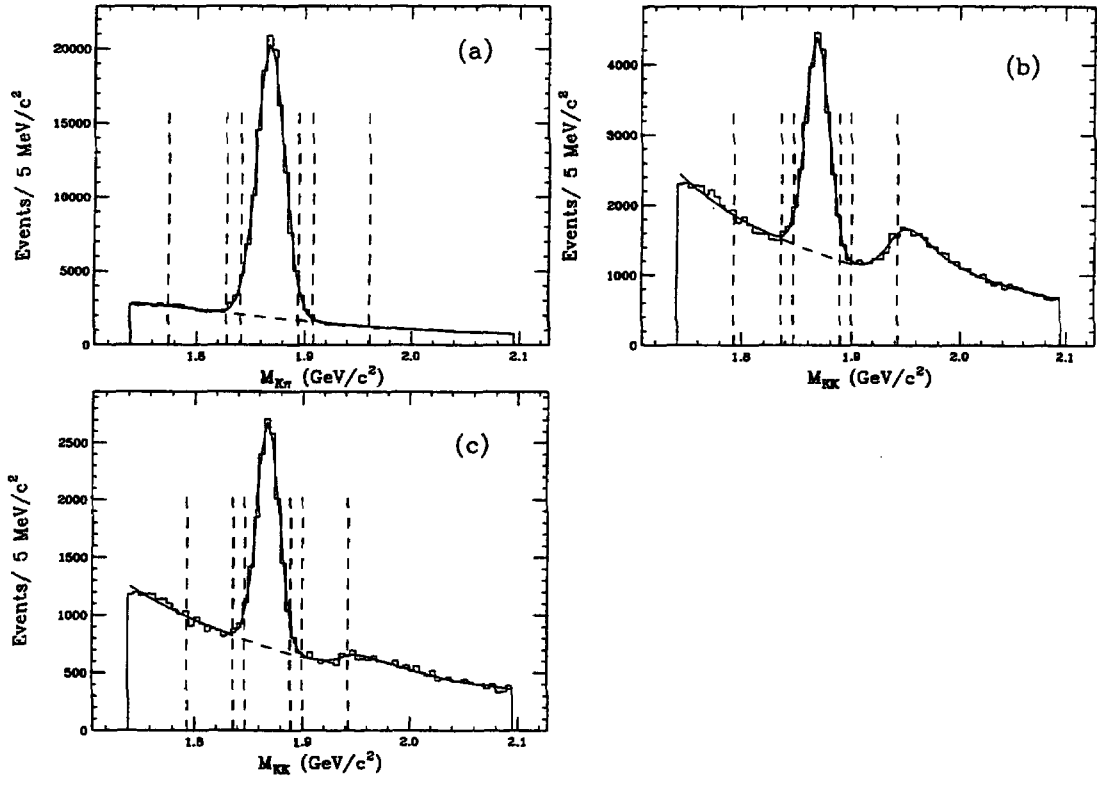


Figure 1. (a) Signal for $D^0 \to K^-\pi^+$ with a detachment cut of $l/\sigma > 5$. The yield is 119,738 $K^-\pi^+$ signal events.

Signals for $D^0 \to K^-K^+$ with a detachment cut of $l/\sigma > 5$. The reflection in the background at higher masses is due to contamination from misidentified $D^0 \to K^-\pi^+$. (b) with loose Cerenkov cuts, we obtain a yield of 16,532 K^-K^+ signal events. (c) with tighter Cerenkov cuts, we obtain a yield of 10,331 K^-K^+ signal events. The vertical dashed lines indicate the signal and sideband regions used for the lifetime and y_{CP} fits.

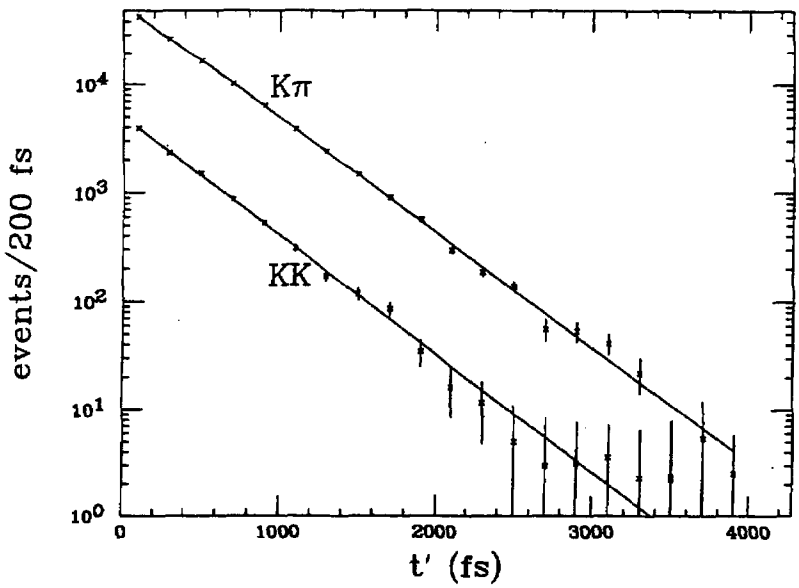


Figure 2. Signal yield versus reduced proper time for $D^0 \to K^-\pi^+$ and K^-K^+ with tight Cerenkov cuts and $l/\sigma > 5$. The fit is over 200 bins of 200 fs bin width. The data is background-subtracted and includes the (very small) Monte Carlo correction. We find $\tau(K^-\pi^+) = 409.2 \pm 1.3$ fs (statistical error only) and using the fit value for y_{cp} we calculate $\tau(K^+K^-) = 395.7 \pm 5.5$ fs (statistical error only).

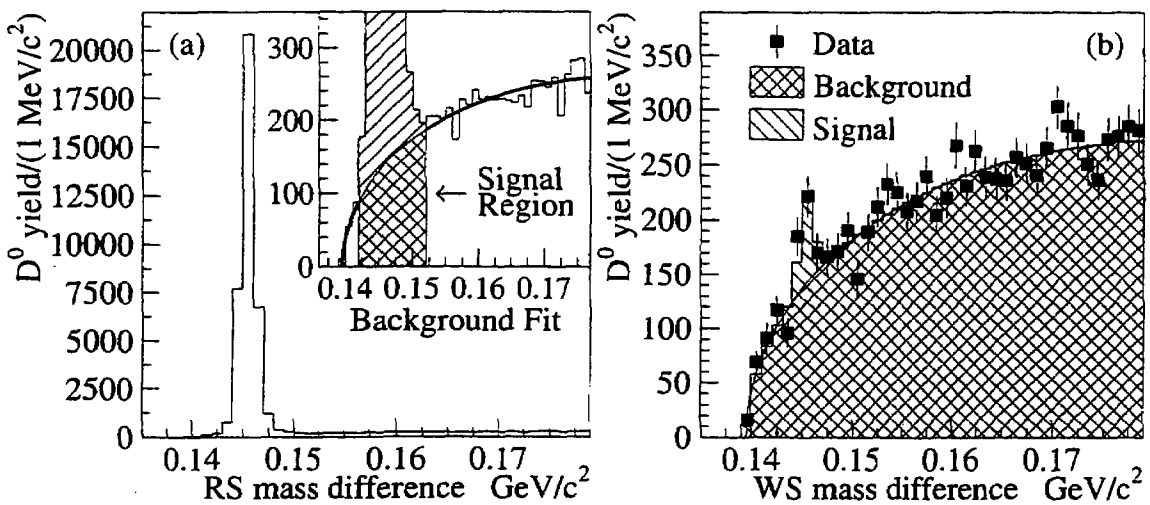


Figure 3. (a) The right-sign (RS) D^{*+}-D^0 mass difference distribution, with the inset showing a closeup of the RS background fit and signal region. (b) The wrong-sign (WS) D^{*+}-D^0 mass difference distribution with the signal and background fit contributions shown.

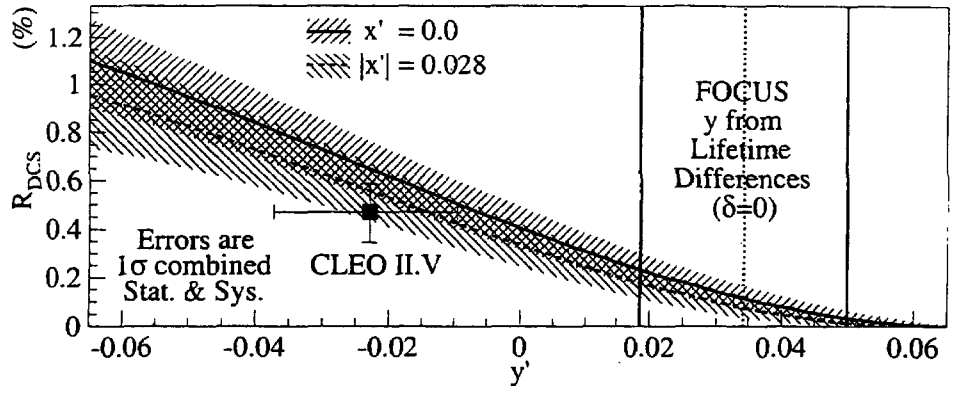


Figure 4. The rate of doubly Cabibbo-suppressed branching fraction relative to the Cabibbo-favored branching fraction plotted as a function of the mixing value y'. Contours are given for two values of x' covering the 95% CL of the CLEO II.V result. Also shown is the FOCUS y plot and the CLEO II.V y' result.

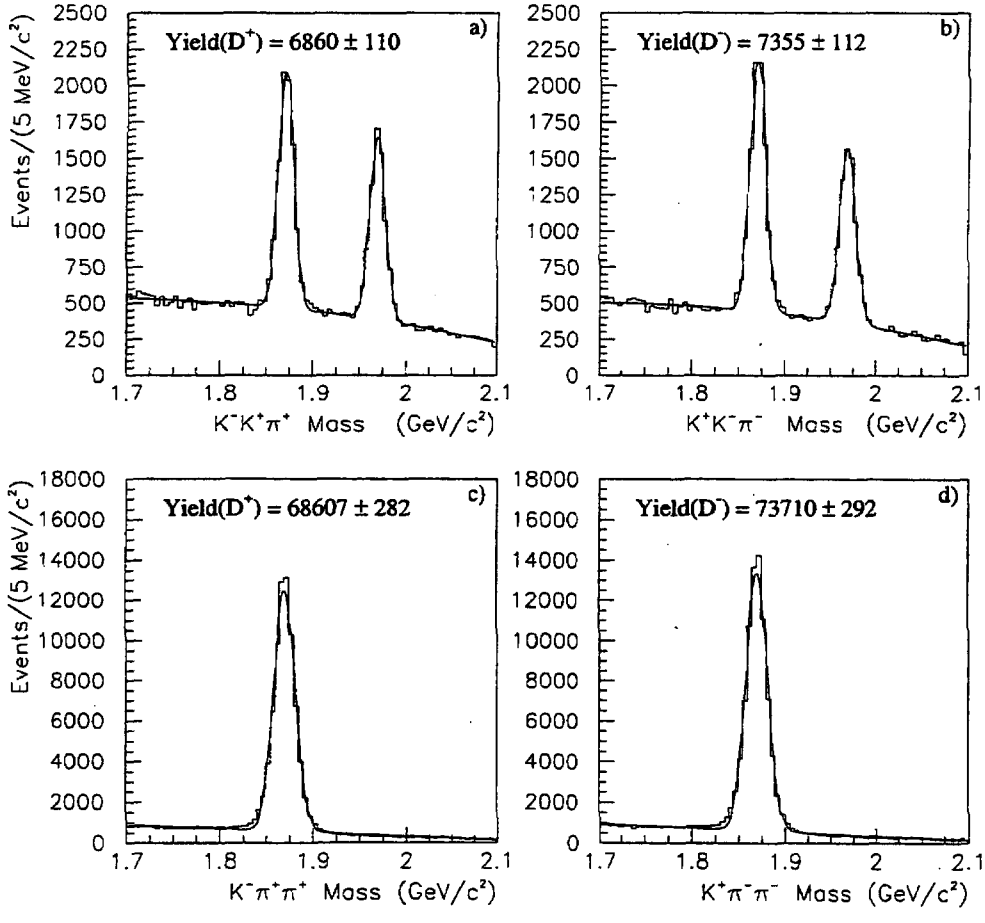


Figure 5. (a) $K^-K^+\pi^+$ invariant mass distribution. (b) $K^+K^-\pi^-$ invariant mass distribution. (c) $K^-\pi^+\pi^+$ invariant mass distribution. (d) $K^+\pi^-\pi^-$ invariant mass distribution. The fits are the solid curves and the numbers quoted are the yields. An asymmetry of A_{cp} $(K^-K^+\pi^+) = +0.006 \pm 0.011 \pm 0.005$ is measured.

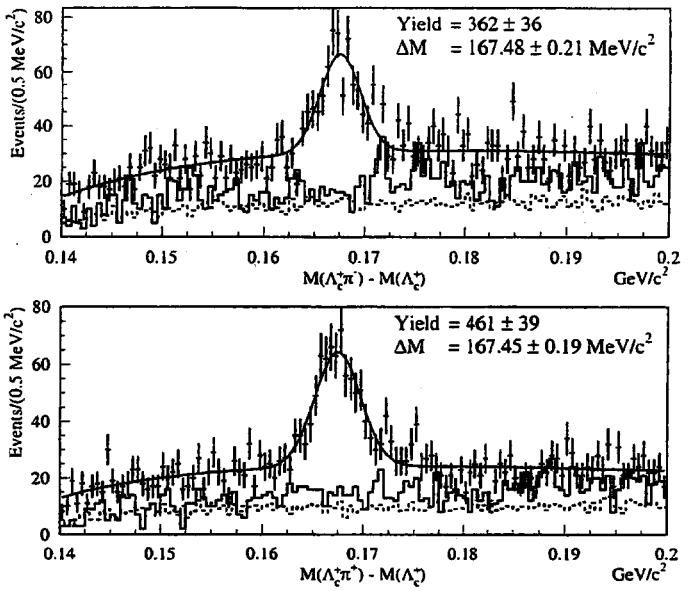


Figure 6. Mass difference distributions for $M(\Sigma_c^0 - \Lambda_c^+)$ and $M(\Sigma_c^{++} - \Lambda_c^+)$. The dotted histograms are found using the Λ_c^+ sideband mass regions. The lower solid histograms are those formed by combining Λ_c^+ candidates with pions from a previous event containing a Λ_c^+ candidate.

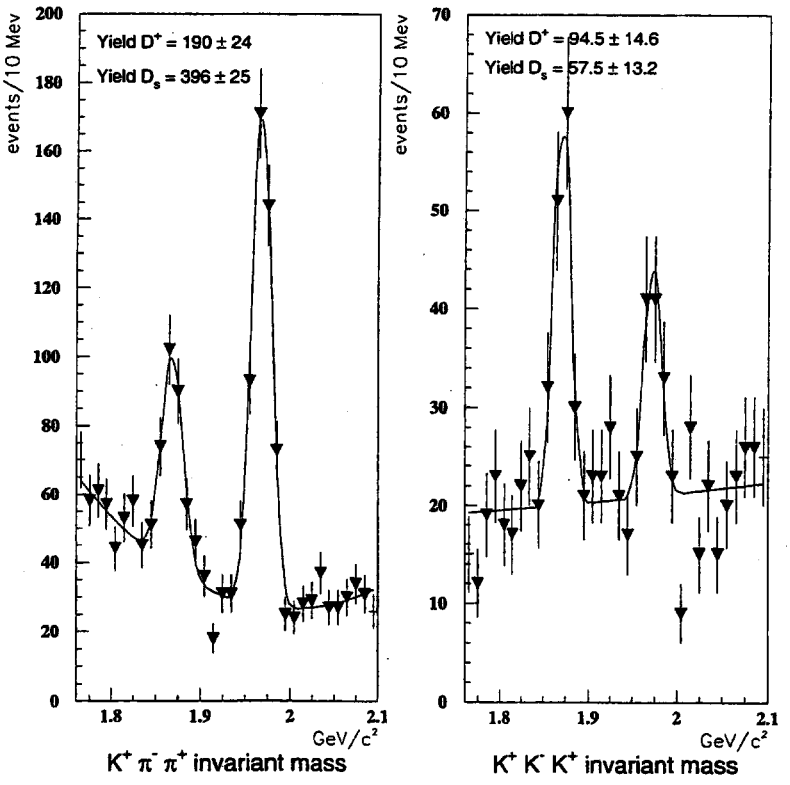
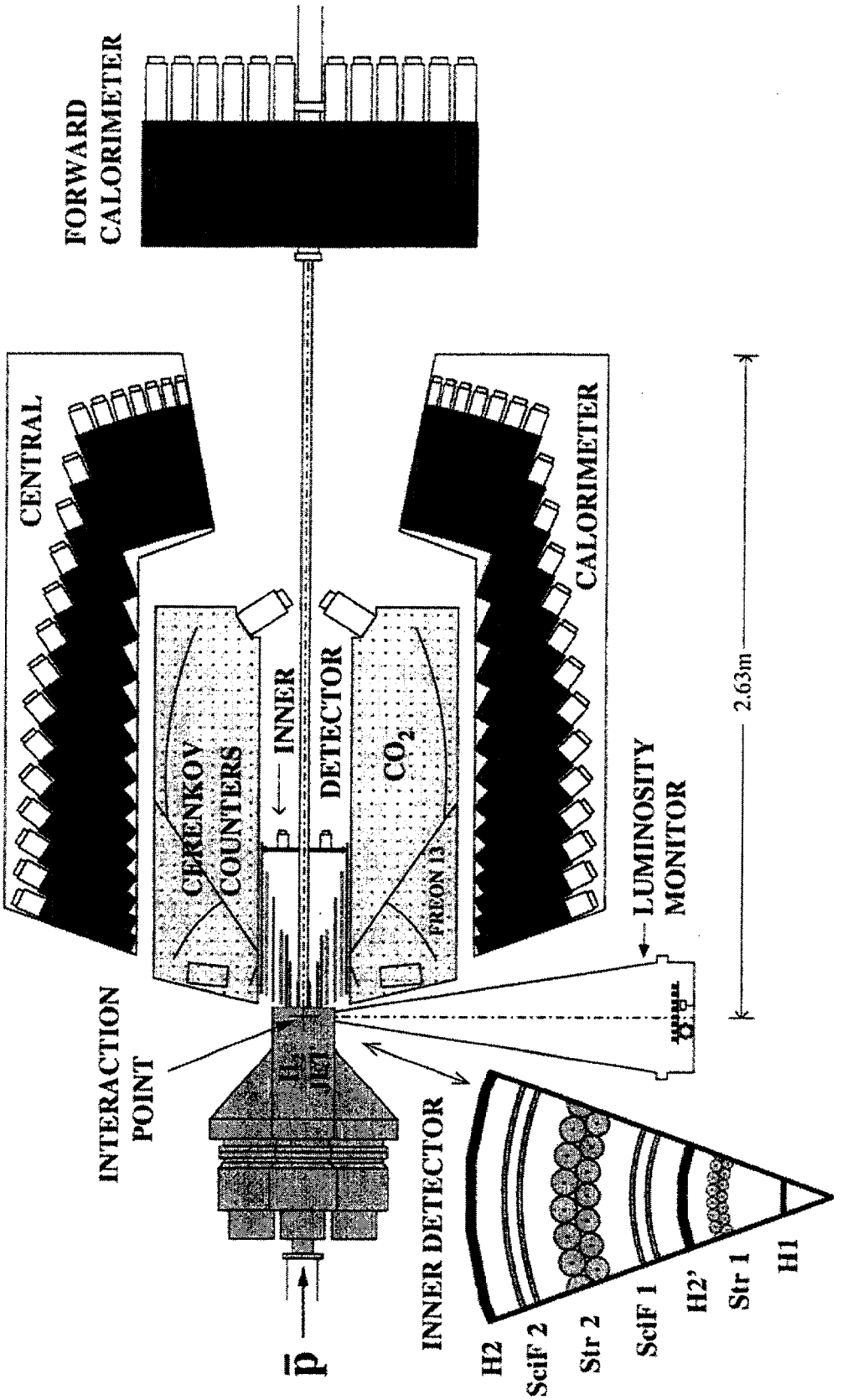


Figure 7. (a) Large sample of doubly Cabibbo-suppressed decays $D^+ \to K^+\pi^-\pi^+$. (b) First evidence for the doubly Cabibbo-suppressed decay $D^+ \to K^+K^-K^+$. The singly Cabibbo-suppressed decays of the D_s meson are present at higher masses in both plots.

E835 EQUIPMENT LAYOUT (Y2K)



E-835 (Cester / Pordes) Study of Charmonium States Formed in Proton-Antiproton Annihilation Using the Fermilab Antiproton Accumulator

UC/Irvine, Fermilab, INFN/Ferrara (Italy), Ferrara (Italy), INFN/Genova (Italy), Genova (Italy), Minnesota, Northwestern, INFN/Torino (Italy), Torino (Italy)

Status: *Data Analysis*

Experiment E-835 was a continuation of E-760, the study of charmonium states formed in $\bar{p}p$ annihilation (see www-e835.fnal.gov). The $\bar{p}p$ annihilations were produced in the Fermilab Antiproton Source where the circulating antiproton beam interacted with a hydrogen gas-jet target. The experiment used a non-magnetic detector with full azimuthal coverage and polar angle coverage from 3 degrees to 65 degrees in the lab frame; the detector was optimized for the identification of electromagnetic final states from charmonium decays. The masses and widths of the decaying states were determined from an excitation curve obtained by varying the $\bar{p}$ beam energy. This technique allows the masses of charmonium states to be measured to an accuracy of 0.1 MeV/c^2; resonance widths as small as 0.1 MeV can also be determined.

E-835 took ~150 pb^{-1} of data during the 1996-97 fixed-target run and a further ~100 pb^{-1} in 2000. The year 2000 data-taking concentrated on improving the mass and width measurements of the χ_0, on further attempts to confirm the $^1P_1$ signal reported by E-760, and on a study of ψ' decay modes.

Topics of analysis include:

the η_c mass, width, and $\gamma\gamma$ branching ratio;

limits on the production of the η_c';

the χ_0 mass, width and branching ratios;

angular distributions in χ_1 and χ_2 decays to $J/\psi\gamma$;

a study of $\phi\phi$ production and a search for $\phi\phi\gamma$ production in $\bar{p}p$ annihilations;

a search for the $^1P_1$ in several decay modes;

a study of ψ' decay modes; and

a study of exclusive two-body reactions.

Publications

A Silicon-Pad Detector for E-835 at Fermilab, A. Buzzo et al., Nucl. Instr. and Meth. A391, 443 (1997).

Experimental Study of a Cylindrical Scintillating Fiber Detector, D. Bettoni et al., IEEE Trans. Nucl. Sci. 44, 460 (1997).

A Straw Chambers' Tracker for the High-Rate Experiment 835 at the Fermilab Accumulator, S. Bagnasco et al., Nucl. Instr. and Meth. A409, 75 (1998).

The Variable Density Gas Jet Internal Target for Experiment E-835 at Fermilab, D. Allspach et al., Nucl. Instr. and Meth. A410, 195 (1998).

The Threshold Gas Cerenkov Counter of Charmonium Experiment E-835 at Fermilab, S. Bagnasco et al., Nucl. Instr. and Meth. A424, 304 (1999).

Measurements of the Magnetic Form Factor of the Proton in the Timelike Region at Large Momentum Transfer, M. Ambrogiani et al., Phys. Rev. D60, 032002 (1999).

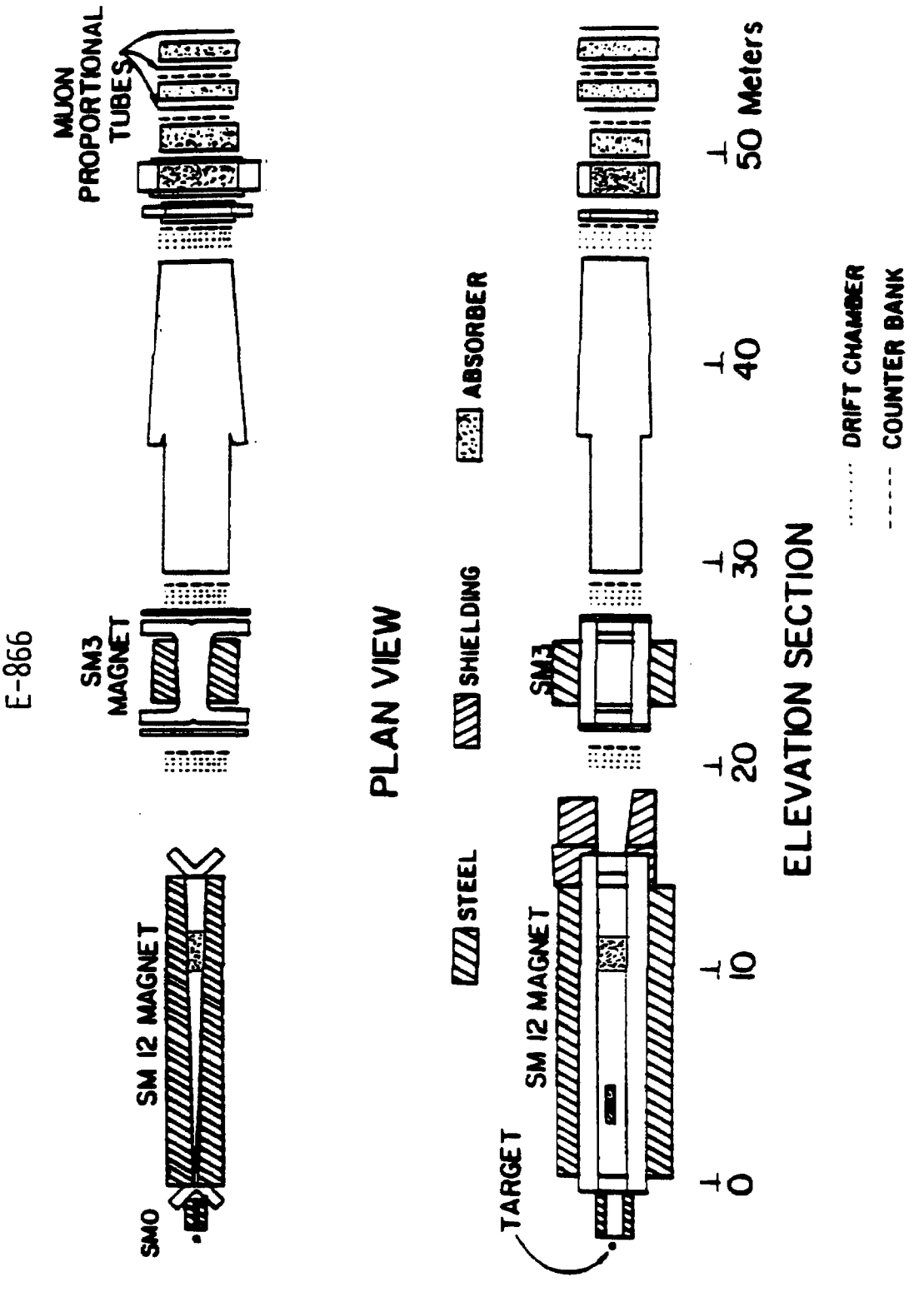
Study of the χ_{c0} State of Charmonium Formed in Antiproton-Proton Annihilations, M. Ambrogiani et al., Phys. Rev. Lett. 83, 2902 (1999).

Measurement of the Branching Ratios $\psi' \to e^+e^-$; $\psi' \to J/\psi\pi^0\pi^0$, and $\psi' \to J/\psi\eta$, M. Ambrogiani et al., Phys. Rev. D62, 032004 (2000).

Study of the $\gamma\gamma$ Decays of the χ_{c2} and χ_{c0} Charmonium Resonances, M. Ambrogiani et al., Phys. Rev. D62, 052002 (2000).

Theses

G. Stancari, University of Ferrara, Italy
W. Baldini, University of Ferrara, Italy
M. Ambrogiani, University of Ferrara, Italy
R. McTaggart, Pennsylvania State University
T. Pedlar, Northwestern University
M. Stancari, University of California/Irvine


E-866
MUON PROPORTIONAL TUBES
SM3 MAGNET
SM 12 MAGNET
SM0
PLAN VIEW
STEEL
SHIELDING
ABSORBER
TARGET
SM 12 MAGNET
SM3
0
10
20
30
40
50 Meters
ELEVATION SECTION
DRIFT CHAMBER
COUNTER BANK

E-866 (Leitch) Measurements of $\bar{d}(x) / \bar{u}(x)$ in the Proton

Abilene Christian, ANL, Fermilab, Georgia State, IIT, LANL, Louisiana, New Mexico State, New Mexico, ORNL, Texas A&M, Valparaiso

Status: *Data Analysis*

E-866 (NuSea) has greatly improved the experimental knowledge of $\bar{d}(x)/\bar{u}(x)$ via a precision measurement of the ratio of Drell-Yan yields from protons incident on hydrogen and deuterium targets. In addition, an extension to the original proposal includes measurements of the Drell-Yan, J/ψ and ψ' nuclear dependences over very broad ranges in x_F and p_T as well as angular distributions at extreme values of x_F.

The experiment completed data-taking in August 1997 with a large amount of data both on $\bar{d}(x)/\bar{u}(x)$ and on nuclear-dependence and angular distributions of Drell-Yan and vector-meson production. Analysis of this data is nearing completion, with preliminary or final results having been presented or published for most of it. Five papers, including three Phys. Rev. Letters, and four Ph.D. theses have been completed. Three more papers are in preparation.

Over 140,000 Drell-Yan muon pairs with dimuon mass $M_{\mu^+\mu^-} \geq 4.5$ GeV/c^2 were recorded. From these data, the ratio of anti-down ($\bar{d}$) to anti-up ($\bar{u}$) quark distributions in the proton sea is determined over a wide range in Bjorken-x. A strong x dependence is observed in the ratio $\bar{d}/\bar{u}$, showing substantial enhancement of $\bar{d}$ with respect to $\bar{u}$ for $x < 0.2$. This result is in fair agreement with recent parton distribution parameterization of the sea. For $x > 0.2$, the observed $\bar{d}/\bar{u}$ ratio is much nearer unity than given by the parameterizations. This has resulted in newer parameterizations which take into account and agree well with our data. Non-perturbative explanations, such as meson-cloud models, are thought to be the source of the observed asymmetries.

Initial results for the nuclear dependence of Drell-Yan and vector-meson production have now been presented or published. The Drell-Yan suppression is attributed almost entirely to shadowing. The vector-meson suppression has dramatic variations with x_F and p_T and shows significant differences between J/ψ and ψ' near $x_F = 0$. These results are interesting in terms of understanding the underlying mechanisms and also towards being able to interpret future data from heavy-ion collisions at RHIC.

Four of our six graduate students have now completed their Ph.D.'s on various physics topics in E-866.

Publications

$\bar{d}/\bar{u}$ Asymmetry and the Origin of the Nucleon Sea, J. C. Peng et al., Phys. Rev. D58, 92004 (1998).

Measurement of the Light Antiquark Flavor Asymmetry in the Nucleon Sea, E. A. Hawker et al., Phys. Rev. Lett. 80, 3715 (1998).

Hardware Trigger System for Fermilab E-866, C. A. Gagliardi et al., Nucl. Instr. and Meth. A418, 322 (1998).

Parton Energy Loss Limits and Shadowing in Drell-Yan Dimuon Production, M. A. Vasiliev et al., Phys. Rev. Lett. 83, 2304 (1999).

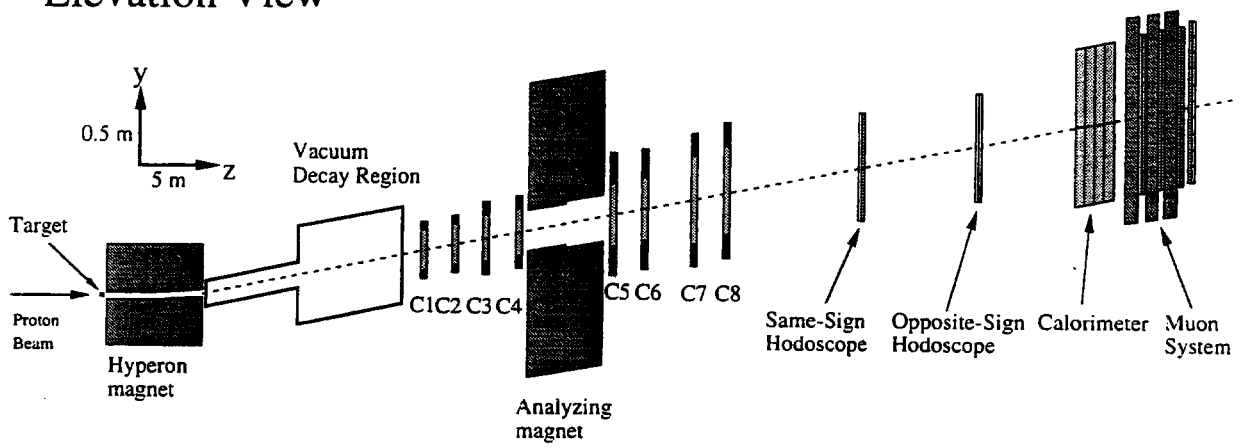
Measurement of Differences Between J/ψ and ψ' Suppression in p-A Collisions, M. J. Leitch et al., Phys. Rev. Lett. 84, 3256 (2000).

Theses

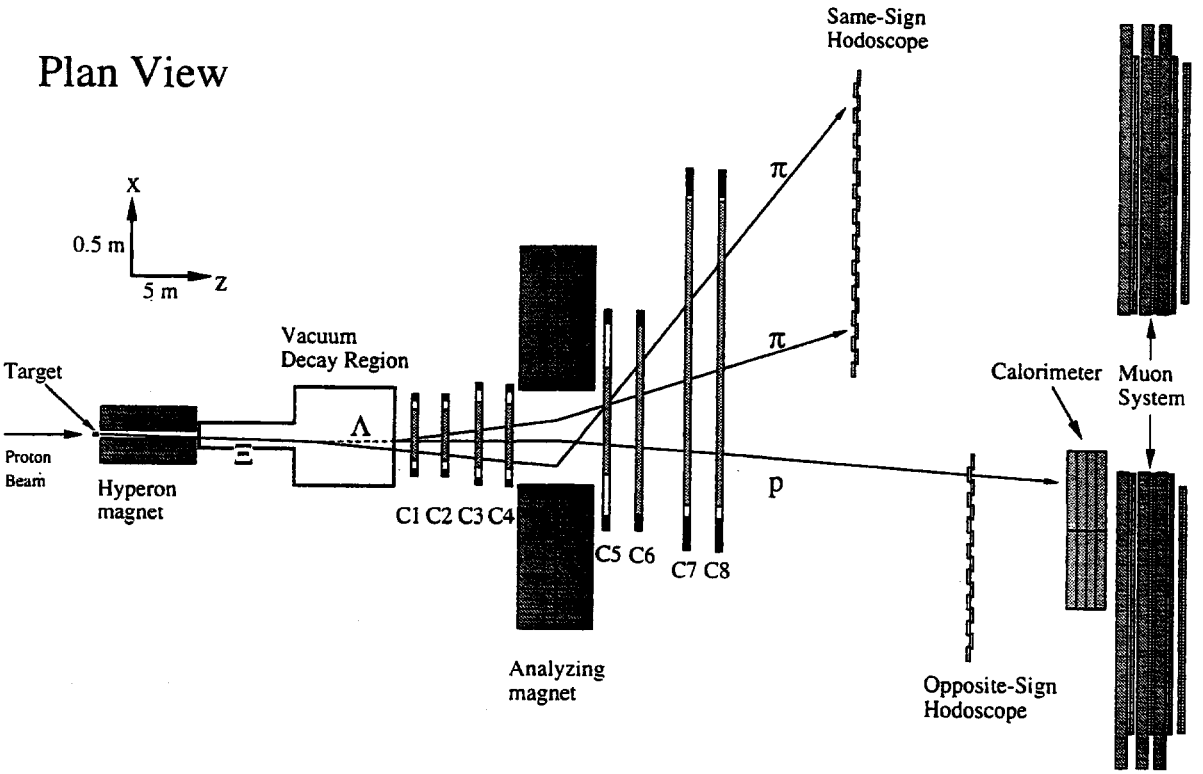
E. Hawker, Texas A&M University, 1998.
R. S. Towell, University of Texas/Austin, 1999.
T. Chang, New Mexico State University, 1999.
W. M. Lee, Georgia State University, 1999.

E-871

Elevation View



Plan View



E-871 (Dukes / Luk) Search for CP Violation in the Decays of $\Xi^- / \bar{\Xi}^+$ and $\Lambda / \bar{\Lambda}$ Hyperons

Academia Sinica (Taiwan), UC/Berkeley, Fermilab, Guanajuato (Mexico), IIT, Lausanne (Switzerland), LBNL, Michigan, South Alabama, Virginia

Status: *Data Analysis*

In the thirty years since the discovery of CP violation our understanding of the phenomenon has improved little despite a long series of beautiful experiments. It still remains a small peculiarity found only in the decays of the K_L. Whether CP violation is a property unique to the kaon system remains an outstanding experimental question.

This important issue is addressed by E-871 (HyperCP) which seeks to perform a high-sensitivity search for CP violation in the decay of Ξ and Λ hyperons. The signature for a CP asymmetry is a difference between the angular distributions (α parameter) of the Ξ^- and $\bar{\Xi}^+$ decay daughters or of the decay daughters of the Λ and $\bar{\Lambda}$. The two measurements are done simultaneously through the decay sequence: $\Xi^- \rightarrow \Lambda\pi^-$, $\Lambda \rightarrow p\pi^-$ and its CP conjugate. The goal of the experiment is a sensitivity in the difference of the α parameters of 10^{-4}, two orders of magnitude better than the current experimental limit. Standard Model predictions range from about 5×10^{-4} to more than an order of magnitude lower. The CP violation is manifestly direct, or $|\Delta S|=1$. The experiment is also performing a high-sensitivity search for rare and forbidden charged hyperon and kaon decays.

The design of the E-871 spectrometer is based on twenty years of experience in doing hyperon physics at Fermilab. The apparatus is simple and has a much higher rate capability than previous hyperon experiments. A target followed by a curved collimator embedded in a dipole (hyperon) magnet produces a momentum and charge-selected secondary beam. Following an evacuated decay region is a wire chamber spectrometer composed of high-rate narrow pitch (1.0 mm – 2.0 mm) wire chambers separated by a dipole spectrometer magnet. There is a total of 19,000 wires. The magnetic fields of the hyperon and spectrometer magnets are periodically reversed to switch between Ξ^- and $\bar{\Xi}^+$ data-taking modes. A simple first-level trigger requiring a left-right charged particle coincidence at the rear of the spectrometer selects events of interest. A hadronic calorimeter on the proton side makes that part of the trigger muon-blind and suppresses triggers due to secondary interactions. Fast front-end latches and a small event size allow an event rate of up to 100,000 per spill second with minimal dead time. A parallel data acquisition system based on the successful E-791 model builds the events and writes them to tape. A muon detector at the rear of the spectrometer allows the search for rare and forbidden decays of charged hyperons and kaons.

We had a successful first run in the 1996-97 fixed-target period, with the spectrometer working as proposed. Approximately 75 billion events on 11,266 data tapes were collected during the run. About twice as much time was spent running on positives as on negatives because of the smaller $\bar{\Xi}^+$ yields. We have reconstructed 1.6 billion $\Xi \to \Lambda\pi$ decays and 280 million $K^\pm \to 3\pi$ decays, as well as a large number of $\Omega \to \Lambda K$ decays. This will yield a statistical sensitivity of about 2×10^{-4} in the search for CP violation in the Ξ-Λ decays.

The experiment completed its second run in January 2000. Modest upgrades to the experimental apparatus resulted in better quality data, and an improvement in the speed of the data acquisition system resulted in a factor of two increase in statistics. By combining the two runs, the projected statistical sensitivity in searching for CP asymmetry in hyperon decays is about 1×10^{-4}.

After the second run, a significant amount of effort was devoted to improving the infrastructure of the hardware and the software for data processing with the PC farm at Fermilab. In parallel, software tools were developed for physics analyses. A major portion of the Monte Carlo package was re-written for better simulation. We are currently processing over 100 TBytes of raw data at Fermilab. This first pass of data processing will be completed by the summer of 2001.

Some preliminary results from the 1996-97 run are now available. We have a new measurement of the branching ratio of $K^+ \to \pi^+\mu^+\mu^-$ which will resolve the disagreement in the results obtained by two different BNL experiments. In addition, we have observed $K^- \to \pi^-\mu^+\mu^-$ for the first time. Theoretical arguments indicated that the decay paramater, α_Ω, of $\Omega^- \to \Lambda K^-$ is very small, a predominantly parity-conserving decay. Based on about 400,000 $\Omega^- \to \Lambda K^-$ decays, we have for the first time demonstrated that α_Ω is indeed small but non-zero.

Publications

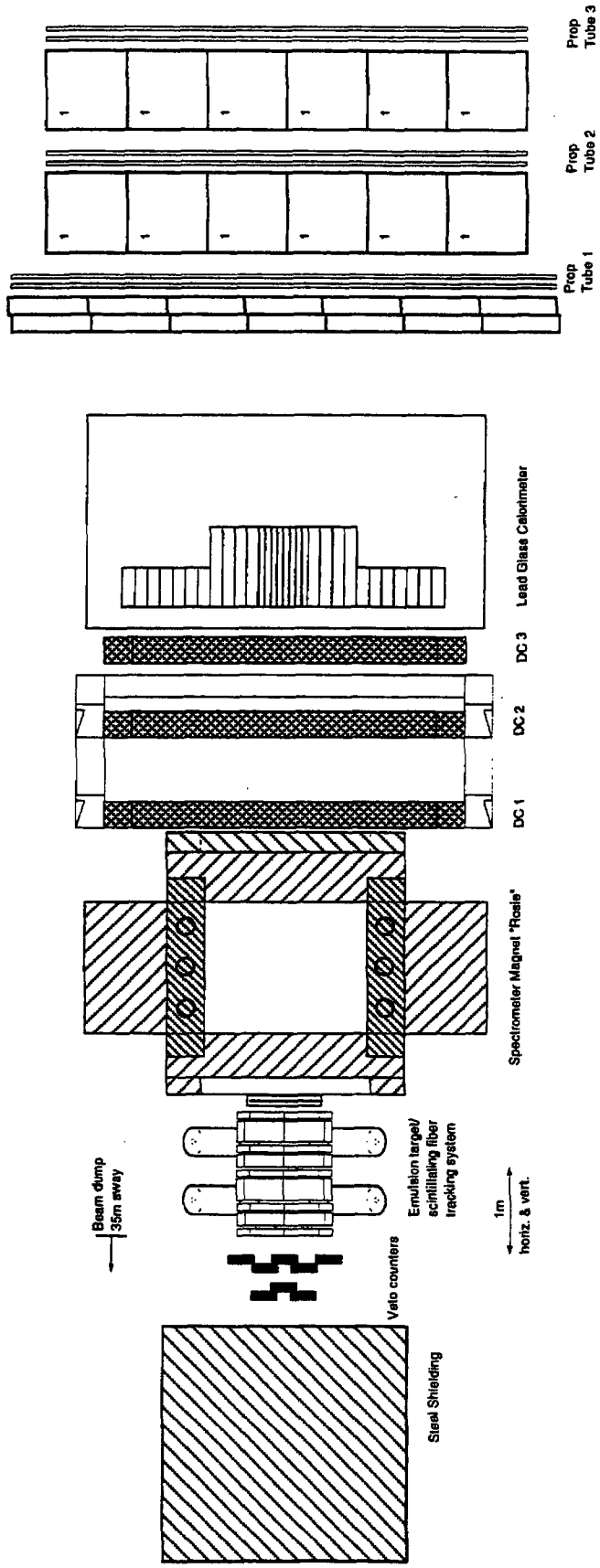
A High-Throughput Data Acquisition System for the HyperCP Experiment, Y.-C. Chen et al., Nucl. Instr. and Meth. A455, 424 (2000).

Upgraded DAQ System for the HyperCP Experiment, C. White et al., submitted to Nucl. Instr. and Meth. (2000).

Thesis

W.-S. Choong, University of California/Berkeley (2000).

E-872 Spectrometer Plan View



E-872 (Lundberg / Paolone) Direct Observation of the Tau-Neutrino $\nu_\tau + N \rightarrow \tau$

Aichi (Japan), Athens (Greece), UC/Davis, Changwon Nat'l (Korea), Coll. de France (France), Fermilab, Gyeongsang (Korea), Kansas State, Kobe (Japan), Kon-kuk (Korea), Korean Nat'l (Korea), Minnesota, Nagoya (Japan), Osaka Sci. Ed. Inst. (Japan), Pittsburgh, South Carolina, Toho (Japan), Tufts, Utsunomiya (Japan)

Status: *Data Analysis*

Since the discovery of the tau lepton in 1975, the desire to detect the ν_τ has been strong, but the experiments that were proposed were technically very challenging and expensive. The use of emulsion, as active targets, in conjunction with its specially designed beam, has enabled DONUT to overcome most of the technical problems. Although there is strong experimental and theoretical evidence that a third neutrino exists, its direct confirmation is an important result. In July 2000, after three years of analysis, four events identified as tau-neutrino interaction were found in a sample of 203 neutrino interactions in an emulsion target/detector.

Experimental observation of ν_τ charged-current interactions requires high proton intensities at high energy coupled to a detector with very high resolution. The 800 GeV primary proton beam from the Fermilab Tevatron along with a high-resolution active target were used. Tau neutrinos are produced in the beam dump predominantly from the leptonic decay of the D_s (charm-strange) meson in the decay sequence $D_s \rightarrow \tau + \nu_\tau$, $\tau \rightarrow \nu_\tau$. Both the D_s and the daughter τ decay in the dump, each decay producing one ν_τ. Their charged-current interactions are found directly by observing τ lepton production and its subsequent decay in the emulsion target. The data run was from April to September 1997 and a total of 4.5×10^{17} protons were used in the beam dump to make neutrinos.

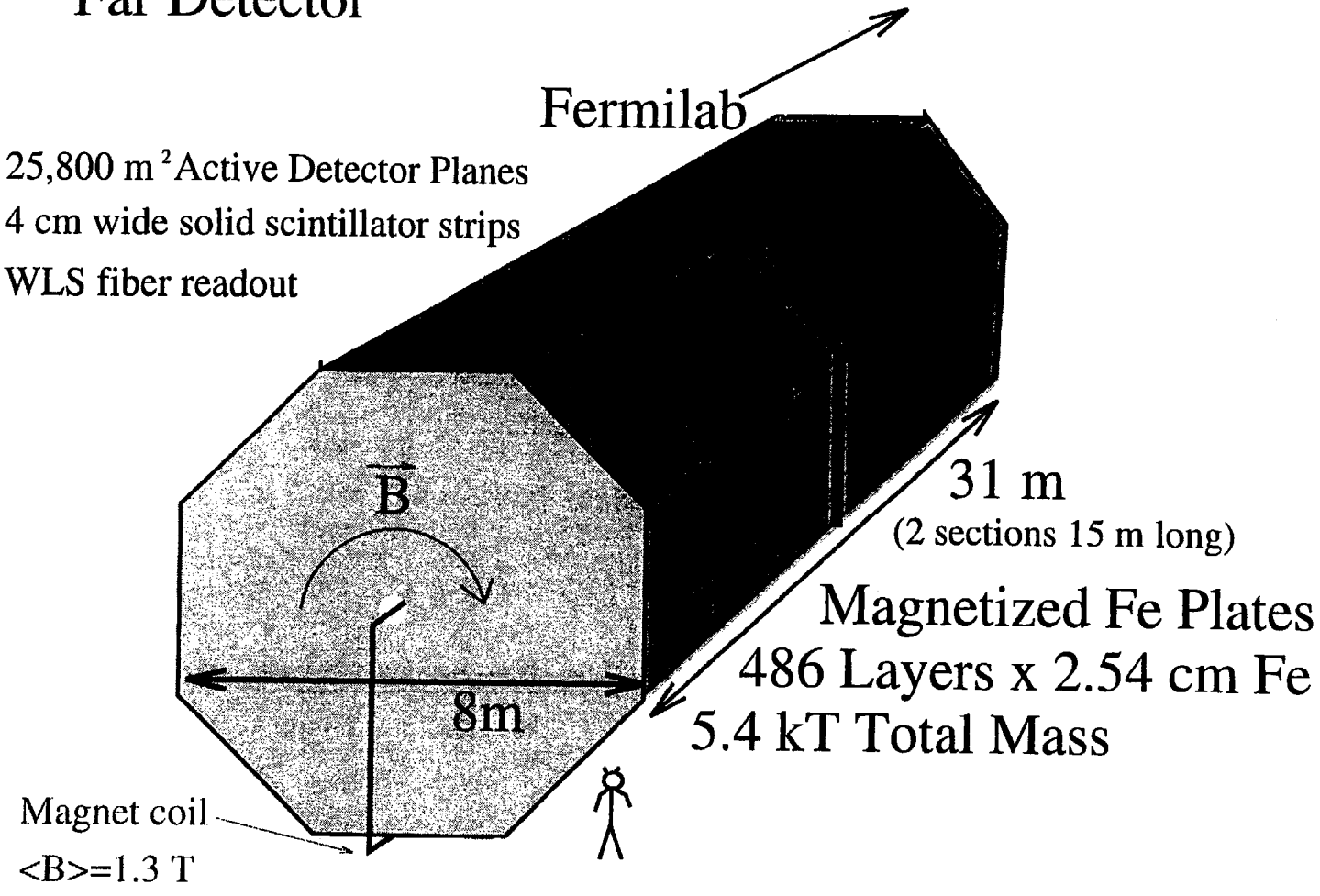
The yield of ν_τ interactions in the emulsion is estimated using the central values for the parameters of D_s production by 800 GeV protons. Uncertainties in the D_s production rate limit the precision of the number of ν_τ interactions to 40%, giving the range of expected interactions of 27 to 62 events in the emulsion.

Two years has been spent in developing emulsion scanning techniques necessary for insuring high efficiency in locating the interactions in the emulsion. The "standard" technique is to locate a well-reconstructed track from the electronic tracking detector into the emulsion stack, and follow this track until it ends at the interaction vertex. This method, also used in the CHORUS experiment, is appropriate for only about 20% of the data in DONUT. Because the emulsion targets are very thick, 6cm, this method of following tracks from the spectrometer is less reliable for vertices in the upstream part

of the target because of secondary interactions, electron showers, and scattering. A second method is used for most of the events, where vertex multiplicities are high. In this method, automatic emulsion scanning stations are programmed to find all tracks in a *volume* of emulsion surrounding the interaction prediction. This data is then processed by finding all 3-track vertices in this volume. For each DONUT event processed in this way, there are up to 10^4 tracks found in every 5 cm^3 of target emulsion. Almost all of these tracks are from background particles, and will not produce a proper topology of a neutral vertex. This powerful method is possible only because of the speed of the present scanning stations. The measured accuracy of the emulsion data is much better than what was expected before the analysis was begun. The routine spatial precision achieved for the emulsion data is 0.3 microns in the transverse coordinates, where 1 micron was initially expected.

The observation of four tau-neutrino interactions out of 203 events (199 events are interactions of electron and muon neutrinos) is consistent with the Standard Model expectations. The analysis which extracted this signal had a 50% efficiency for finding tau decays, and about 25% of the total number of interactions have been completely analyzed. The physical background processes that give a false tau signal are well understood and are demonstrated to be small, amounting to less than 0.4 events. Systematic effects, such as false vertices or decay kinks are believed to be negligible since the accuracy of the emulsion measurements is so high. Presently, more events are being analyzed for tau decays and it may be possible to double the total number of events to 400 neutrino interactions.

MINOS (Main Injector Neutrino Oscillation Search)
Far Detector



E-875 (Wojcicki) Main Injector Neutrino Oscillation Search

ANL, Athens (Greece), BNL, Caltech, Cambridge (United Kingdom), Chicago, Elmhurst, Fermilab, Harvard, IHEP/Beijing (China), IHEP/Protvino (Russia), Indiana, ITEP (Russia), James Madison, Lebedev (Russia), LLNL, Macalester, Minnesota, Minnesota/Duluth, Northwestern, Oxford (United Kingdom), Pittsburgh, Rutherford (United Kingdom), South Carolina, Stanford, Sussex (United Kingdom), Texas A&M, Texas/Austin, Tufts, Univ. College London (United Kingdom), Western Washington, Wisconsin

Status: *No Data Yet*

The goal of the Main Injector Neutrino Oscillation Search (MINOS) experiment is a comprehensive investigation of neutrino oscillations, down to a level of about 10^{-3} eV^2 in Δm^2 and 10^{-2} in $\sin^2(2\theta)$, using neutrinos produced by the Fermilab Main Injector beam and a large new detector located at the Soudan Mine in Minnesota, some 735 km away. The existing Soudan 2 detector at the same site may also contribute to these studies. A "near detector" located at Fermilab will monitor the beam and enable a comparison to be made between neutrino interactions in detectors at two quite different distances from the neutrino source. The approach of our experimental program is to perform a variety of different measurements, all of which would be sensitive to neutrino oscillations. A self-consistent interpretation of all these measurements would be required for a claim of observation of neutrino oscillations.

Neutrino physics presents today one of the most promising avenues to probe for extensions of the Standard Model. A priori, no fundamental reason exists why neutrinos should have zero mass or why there should be no mixing between different neutrino species. Thus, the existence of neutrino oscillations is quite plausible, maybe even likely, on theoretical grounds. The existence of this phenomenon has received strong experimental support, both from the observations of a deficit of solar neutrinos and from the apparent ν_μ/ν_e anomaly in the interactions of atmospheric neutrinos observed by large underground experiments. Furthermore, many of the attractive theoretical models predict a mass hierarchy i.e., $m_{\nu e} << m_{\nu\mu} << m_{\nu\tau}$. Thus a search for oscillations into the tau mode, especially from an initial ν_μ beam, may be one of the most promising experimental approaches.

This experiment makes use of several independent measurements to investigate neutrino oscillations. Comparison of event characteristics at the near and far detectors is used to determine oscillation modes: $\nu_\mu \rightarrow \nu_\tau$, $\nu_\mu \rightarrow \nu_e$, $\nu_\mu \rightarrow \nu_{sterile}$. We use the ν_μ charged-current event energy spectrum to measure the oscillation parameters, Δm^2 and $\sin^2(2\theta)$. With the medium and high-energy beams the experiment can observe $\nu_\mu \rightarrow \nu_\tau$ oscillations directly, via ν_τ charged-current events and subsequent τ decay. Most of our oscillation studies rely on near-detector/far-detector comparisons in order to minimize the effects

of uncertainties in neutrino beam energy spectra and detector response. Our proposal to add the "hadron hose" focusing device to the neutrino beamline is largely motivated by the need to predict accurately the energy spectrum at the far detector in the absence of oscillations. This device consists of a wire along the axis of the decay pipe that is pulsed to high current. Its focusing makes the energy spectra at the near and far detectors more similar and minimizes the effects of beam model uncertainties.

One of the design goals of our experiment is to provide the maximum possible flexibility to respond to future improvements in our knowledge of neutrino oscillations. For example, the neutrino beam has been designed with a movable production target and magnetic horns to allow operation in different neutrino energy ranges: low (2-4 GeV), medium (4-8 GeV), and high (8-16 GeV). In response to results from the Super-Kamiokande experiment, which suggest that Δm^2 is lower than indicated by earlier experiments, we now expect to begin operation with the low-energy beam configuration.

The MINOS experiment uses two very similar detectors, one at Fermilab and one in Minnesota's Soudan mine, 735 km away. Both detectors consist of assemblies of 1 inch-thick magnetized steel planes, interleaved with planes of 4 cm wide strips of plastic scintillator. The 1 kT near detector at Fermilab has 4.8 m wide steel planes; the 5.4 kT far detector at Soudan has 8 m wide planes arranged in two supermodules. The steel planes in both detectors are magnetized toroidally with an average field of 1.3 T. We estimate that, in the absence of oscillations, the far detector would record about 2,500 charged-current ν_μ interactions annually using the low-energy beam configuration. In addition, the existing 1 kT Soudan 2 detector could allow a complementary study of neutrino interactions, with much finer granularity but lower statistics.

The existing underground physics laboratory in the Soudan Mine is now being expanded to house the new MINOS far detector, as shown in Figure 1. Excavation of the new laboratory began in May 1999, and installation of the far detector is scheduled to begin in the summer of 2001. Site preparation for the construction of the underground NuMI beam facility at Fermilab has been completed and excavation of the underground enclosures, including the near detector hall, began during the spring of 2000. Data-taking is scheduled to begin, with the near detector and the first half of the far detector, when the neutrino beam commissioning starts in late 2003.

Status and Accomplishments

November 1998:	NuMI/MINOS Project baselined by the Department of Energy.
February 1999:	DOE CD-3a (start limited construction) approved.
March 1999:	MINOS steel purchase subcontract awarded.
May 1999:	DOE CD-3b (continue construction at Fermilab) approved.
May 1999:	Excavation of far detector lab started at Soudan.
June 1999:	Top of Soudan mineshaft located with GPS survey.

October 1999:	Near detector electronics design upgraded for fast extraction.
November 1999:	Detector 4-plane prototype erected at Fermilab.
November 1999:	Site preparation completed for Fermilab civil construction.
March 2000:	Excavation of NuMI beamline tunnels and halls started at Fermilab.
September 2000:	Caltech scintillator module factory commissioned.
November 2000:	Excavation of far detector cavern completed at Soudan.
December 2000:	Far detector cavern outfitting started at Soudan.

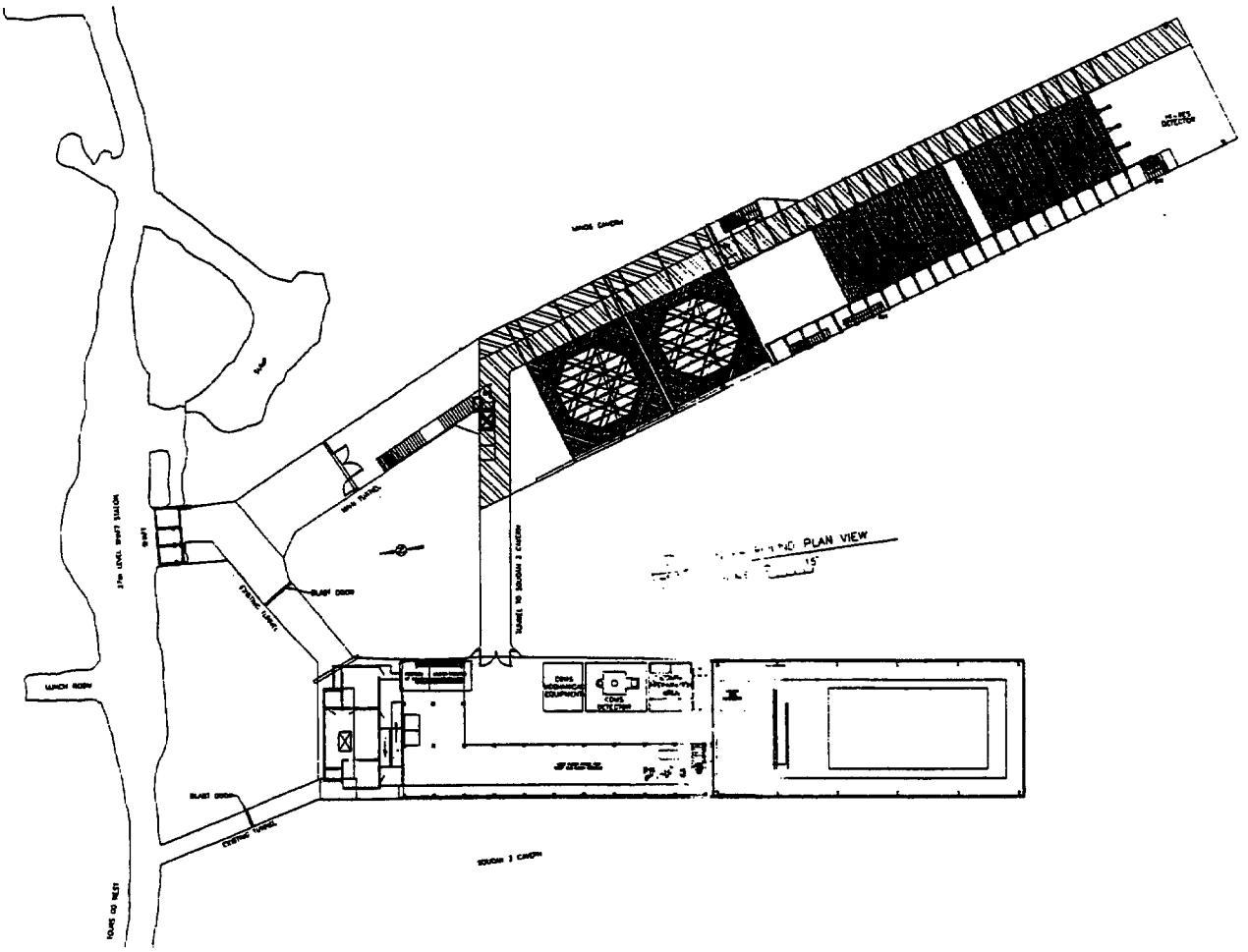
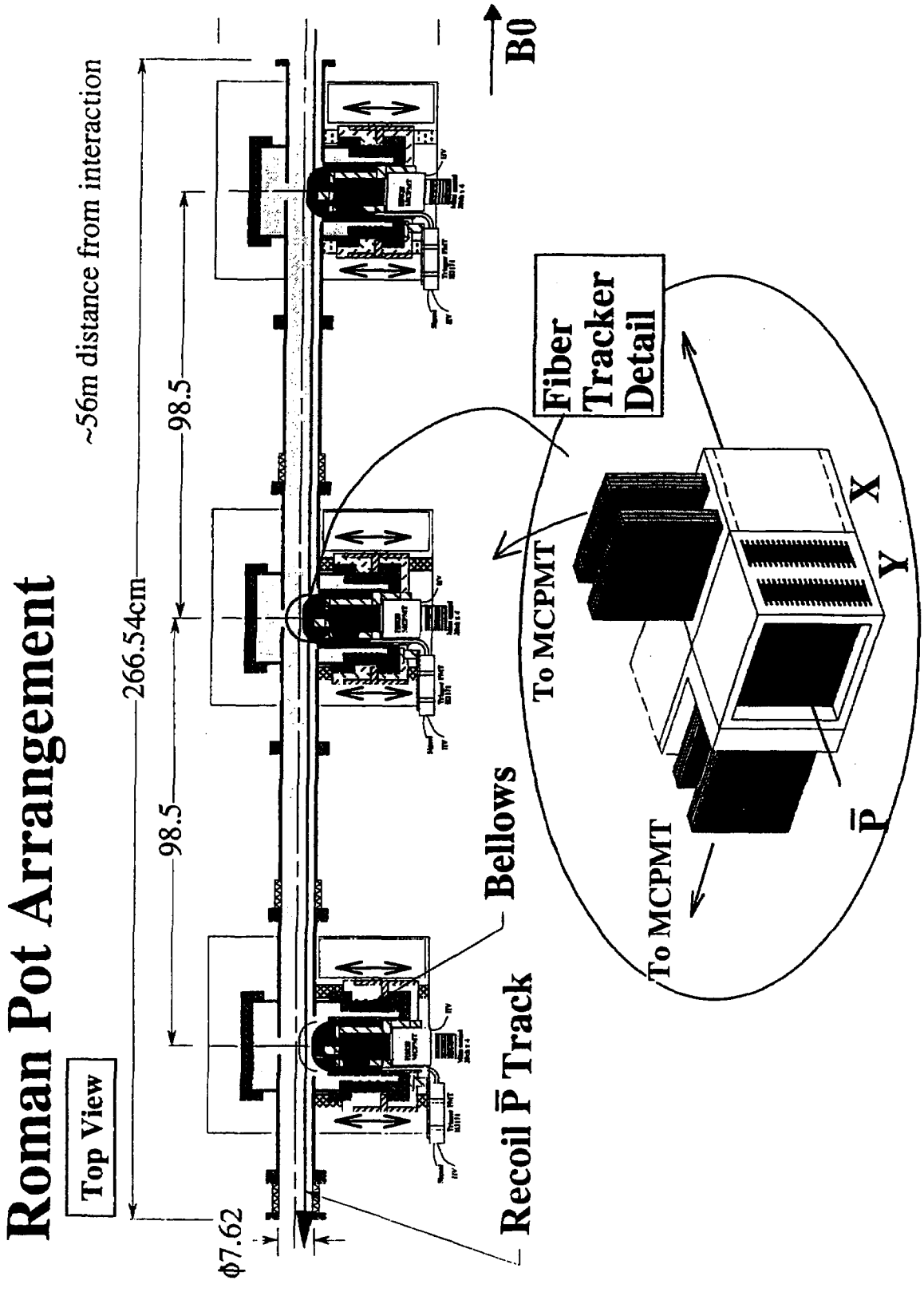


Figure 1. Plan view of MINOS detector in the Soudan Mine.


E-876
Roman Pot Arrangement
Top View
~56m distance from interaction
266.54cm
98.5
98.5
ϕ7.62
Bellows
Recoil $\bar{P}$ Track
B0
Fiber Tracker Detail
To MCPMT
To MCPMT
X
Y
$\bar{P}$

E-876 (Albrow) Hard Diffraction Studies in CDF

Academia Sinica (Taiwan), ANL, Bologna (Italy), Brandeis, UCLA, Chicago, Duke, Fermilab, Frascati (Italy), Harvard, Hiroshima (Japan), Illinois, Inst. of Particle Phys. (Canada), Johns Hopkins, KEK (Japan), LBL, MIT, Michigan, Michigan State, New Mexico, Osaka City (Japan), Padova (Italy), Pennsylvania, Pisa (Italy), Pittsburgh, Purdue, Rochester, Rockefeller, Rutgers, Texas A&M, Texas Tech, Tsukuba (Japan), Tufts, Waseda (Japan), Wisconsin, Yale

Status: *Data Analysis*

In a proton-antiproton collision at the Tevatron, sometimes the proton or antiproton or both can emerge unscathed, even though a hard quark or gluon scattering has occurred giving rise to high transverse momentum jets. These are called diffractive interactions, being related to elastic scattering. The best theory of strong interactions, Quantum ChromoDynamics (QCD), enables us to calculate the hard scattering, but the process by which the beam particle(s) can remain intact is not well understood. It certainly involves soft (low momentum transfer or non-perturbative) processes in which the QCD coupling is large and many gluons can be exchanged, making it very difficult to calculate. This is an important frontier of QCD, especially as it is related to quark and gluon confinement. In any hard interaction involving hadrons there is a transition between a phase in which we consider (colored) quarks and gluons and the final state when they are all confined in (colorless) hadrons. During this transition sometimes colorless clumps of hadrons form, well separated from each other in rapidity (a relativistic transformation of speed). These collisions have rapidity gaps which are large regions of rapidity without any hadrons. The extreme process where the rapidity gap is maximum is elastic scattering, a very common process which still needs to be understood theoretically.

The distribution of quarks and gluons inside a proton is called its structure function. This can be measured from the kinematics of two or three high transverse energy jets resulting from a hard scattering. When the jets are produced in a diffractive event, with a large rapidity gap and a leading intact proton and/or antiproton, from the jet kinematics we can measure the diffractive structure function. We find that the diffractive structure function falls faster with the momentum fraction (Bjorken-x) than the normal structure function. So as the x of the scattering quark or (usually) gluon decreases it becomes more likely that the event will be diffractive. Usually in a hard quark or gluon scattering the proton and antiproton are left in a colored state and break up into many hadrons. About 1% of the time other gluons can be exchanged with the appropriate characteristics (color and momenta) to leave the (anti-)proton colorless and intact. In about 1% of those collisions both beam particles are left intact (a process called double pomeron exchange).

Diffractively scattered antiprotons have very small angles and stay in the beam pipe until we intercept them after 56 m with small (2cm × 2 cm) tracking detectors. These have crossed (x and y) scintillating fiber hodoscopes which measure the antiproton track with a precision of 100 microns. From this track, the position of the collision as determined by the central CDF detectors (which measure the jet tracks), and our knowledge of the magnetic fields in the Tevatron, we determine the momentum of the antiproton. From the central jets we determine the momenta of the scattering gluons (or quarks). This enables us to calculate Bjorken-x and hence the diffractive structure function.

Diffractive experiments with rapidity gaps are studied at HERA in Germany, in electron-proton collisions. We find that a simple model in which the proton emits a pomeron (a color singlet composite of gluons and quarks with the same quantum numbers as the vacuum) which then interacts with the other proton (in pp) or with the photon radiated from the electron (in ep) does not work. This is called non-factorization. This means that some of the models of this process have to be re-thought.

Data were taken in December 1995 - February 1996. Two papers have been published (and produced Ph.D. theses) and another two are being worked on.

Publications

Diffractive Dijets with a Leading Antiproton in $\bar{p}p$ Collisions at $\sqrt{s} = 1800$ GeV, T. Affolder et al., Phys. Rev. Lett. 84, 5043 (2000).

Dijet Production by Double Pomeron Exchange at the Fermilab Tevatron, T. Affolder et al., Phys. Rev. Lett. 85, 4215 (2000).

E-881

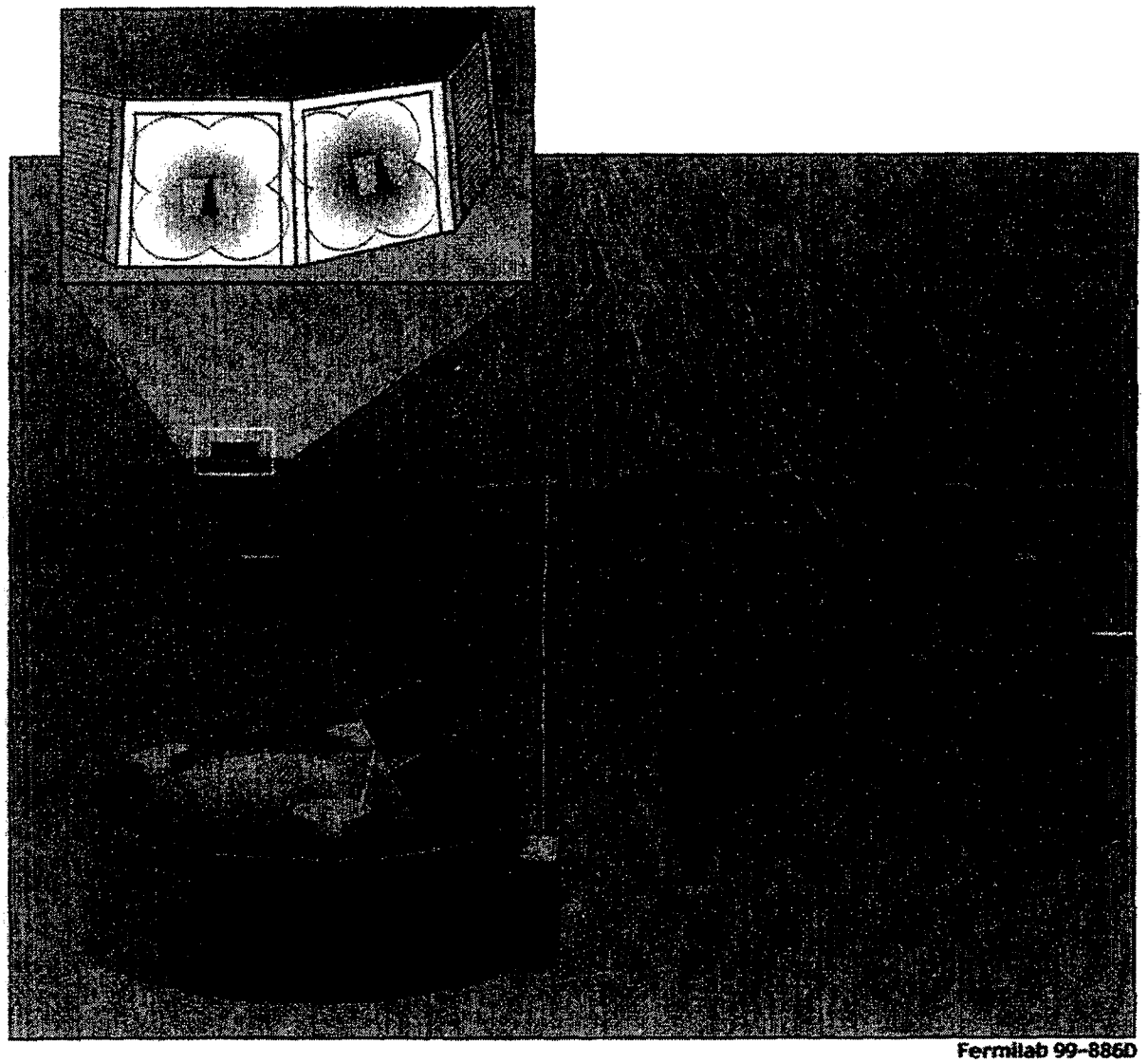


Illustration of the detector systems used in the Pierre Auger Project. Self-contained particle detectors are spaced on a 1.5 km grid over the surface. The air showers are also observed on dark nights using air fluorescence telescopes (inset).

E-881 (Mantsch) The Pierre Auger Project - A Study of the Highest-Energy Cosmic Rays

Fermilab
(and institutions in 19 countries)

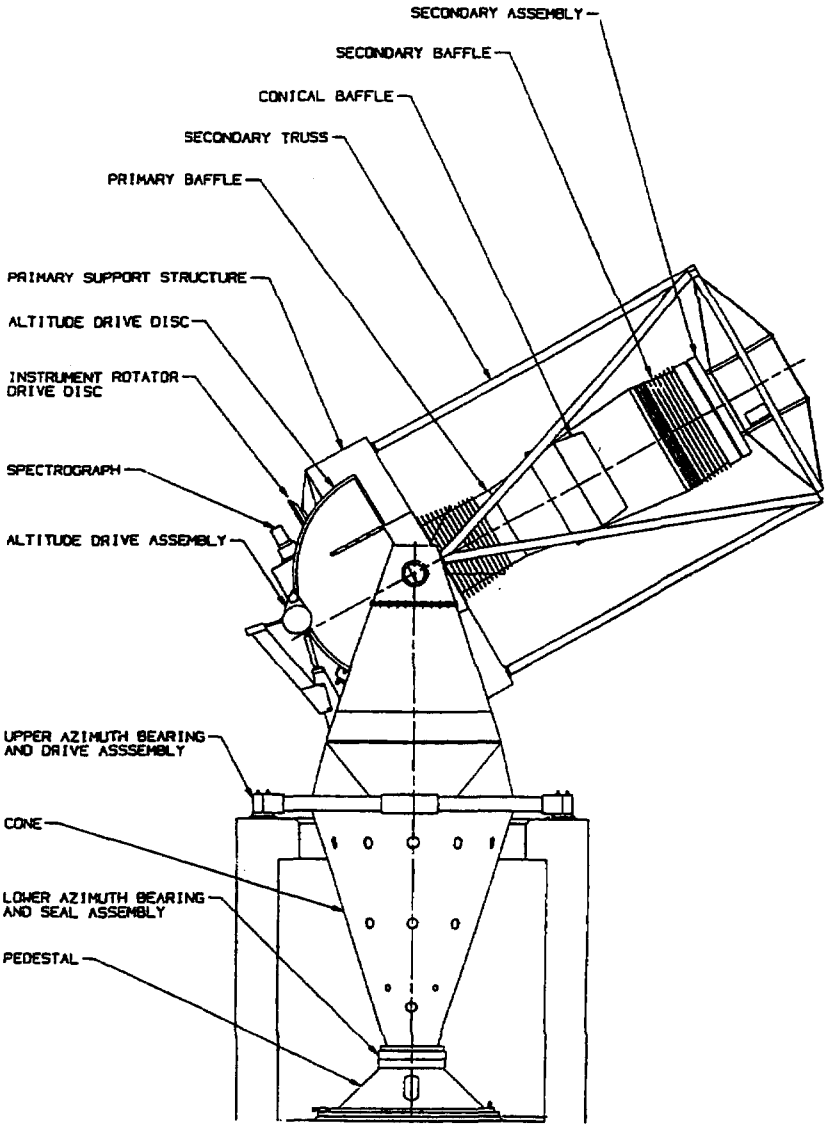
Status: *No Data Yet*

Over the past thirty years cosmic ray air shower detectors have recorded a number of events with energies greater than 10^{20} eV. In 1991, the collaboration operating the Fly's Eye atmospheric fluorescence detector in Utah recorded an event for which the primary energy was calculated to be $3.2\pm 0.9\times10^{20}$ eV (51 joules). Two years later, the AGASA air shower array at Akeno, Japan, observed an event with energy of $(1.7\text{-}2.6)\times10^{20}$ eV. These super-high-energy events are extraordinary for two reasons. First, there are no known acceleration mechanisms that can produce particles of these energies. Second, attenuation lengths for cosmic rays with energy greater than 1.5×10^{19} eV is less than about 30 Mpc. This attenuation (known as the Greisen-Zatsepin-Kuzmin cut off) results from the interaction of cosmic ray particles with the cosmic microwave background. Thus particles can have these energies only if they are produced relatively nearby. The high magnetic rigidity of these particles also means that they suffer little deflection from magnetic fields in the galaxy and in intergalactic space. Yet none of the particles observed points back to a possible astrophysical source within the distance limit imposed by the background radiation.

The Pierre Auger Project is a broadly-based international effort to make a detailed study of cosmic rays at the highest energies. Two air shower detectors are proposed, one to be placed in the Northern Hemisphere and one in the Southern Hemisphere. Each installation will consist of an array of about 1600 particle detectors spread over 3000 km^2. Each installation will also have three atmospheric fluorescence detectors viewing the volume above the surface array. These two air shower detector techniques working together form a powerful instrument for the proposed research. The objectives of the Pierre Auger Project are to measure the arrival direction, energy, and mass composition of 90 events per year above an energy of 10^{20} eV and 9000 events per year above 10^{19} eV. A collaboration has been formed and preferred sites chosen. Groundbreaking for construction of the southern Auger detector in Mendoza, Argentina took place in March 1999. Construction of the northern detector will begin in about 2003. Both detectors should be complete in six years. Commitments for funds for the southern detector including those from the US DOE and NSF are in hand.

Fermilab is playing an important role in the Auger Project. In addition to scientific participation, Fermilab brings to bear its substantial experience with projects of this scope. An R&D program is currently underway with other collaborators to develop the water Cerenkov surface detector station. Fermilab is participating in the development of the central data acquisition system. The overall project management for the Auger Project is based at Fermilab.

E-885


SECONDARY ASSEMBLY
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PRIMARY SUPPORT STRUCTURE
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INSTRUMENT ROTATOR DRIVE DISC
SPECTROGRAPH
ALTITUDE DRIVE ASSEMBLY
UPPER AZIMUTH BEARING AND DRIVE ASSSEMBLY
CONE
LOWER AZIMUTH BEARING AND SEAL ASSEMBLY
PEDESTAL

E-885 (Kent) Sloan Digital Sky Survey

Fermilab
(and Chicago, Inst. for Adv. Study, Japan Promotion Group [Japan], Johns Hopkins, Max Planck/Garching [Germany], Max Planck/Heidelberg [Germany], New Mexico, Princeton, US Naval Observatory, Washington)

Status: *Data-Taking*

The Sloan Digital Sky Survey (SDSS) intends to reveal large-scale structure in the distribution of galaxies with a spatial extent and precision in its determination that greatly exceed current capabilities. This map of the large-scale distribution of galaxies will serve to constrain models for the origin and evolution of that structure, and thereby to address fundamental questions in cosmology and astrophysics, including the amount and distribution of mass with respect to the luminous material in the Universe.

To achieve these goals, one million galaxy redshifts are to be measured to a uniform flux limit within a solid angle of pi steradians, away from the obscuring disk of the Milky Way. The need for a uniform and well-calibrated flux limit requires a new imaging survey to be conducted, from which the spectroscopic (redshift) target list will be derived. This imaging survey yields a two-dimensional map of the same region, which itself will provide new cosmological information since the detection threshold of the imaging survey is much fainter than that of the spectroscopic survey. A wide-field 2.5-m telescope (see adjacent figure) dedicated to this project is operating at Apache Point Observatory, near Sunspot, New Mexico. The imaging system and the spectroscopic system share the same focal plane via an instrument exchange mechanism (see Figures 1 and 2). The unique data products include the multi-band imaging survey (there are five wave bands covering the visible spectral range, the data from which are collected nearly simultaneously), and the inclusion of quasar candidates along with the galaxies.

A crack in the secondary mirror was successfully repaired, and the telescope returned to service early in 2000. The SDSS began formal operations on April 1, 2000. Imaging and spectroscopic data have been collected and processed every month since then except for a six-week shutdown period during the summer. To date, approximately 1700 square degrees of imaging data and over 60,000 spectra of galaxies and quasars have been collected that meet survey specification. About 174 plug plates for spectroscopy have been designed and drilled from the processed imaging data. Three major reviews of the project were held during the year, covering survey operations and data distribution plans.

Fermilab's primary responsibility to the project at this point is to maintain the data acquisition systems at APO and to maintain and operate the data-processing pipelines at Fermilab. The science coding is done by scientists throughout the collaboration, including Fermilab. A major focus has been to structure the data-processing pipelines into a "factory" with full control of

pipeline versioning, data inputs, and quality analysis so as to streamline data processing as much as possible. Approximately 2 terabytes of imaging data and smaller volumes of spectroscopic and photometric calibration data have been processed to date, with much of it reprocessed multiple times as pipelines are refined and improved. Fermilab is also responsible for a number of hardware systems, including the telescope controls and interlock systems, the instrument lift system, spectroscopic cartridge handling systems, and an automated system that identifies and maps the location of optical fibers randomly plugged into the fiber cartridge focal-plane plates. Finally, Fermilab is providing a full-time telescope engineer, two technicians, and a project manager.

A steady stream of discoveries continues to be made with the data collected thus far. The most distant known object in the universe has been discovered (a quasar at z = 5.8). Definitive evidence has been found for substructure in the stellar halo of the Milky Way; this substructure may be tidal debris from dwarf galaxies orbiting the Milky Way (Figure 3). Brown dwarfs have been identified that bridge the gap between L and T classes of these objects (the classification depends primarily on the temperature). First analyses are being made of the luminosity function of galaxies and of large-scale structure deduced from the combined imaging/spectroscopic surveys.

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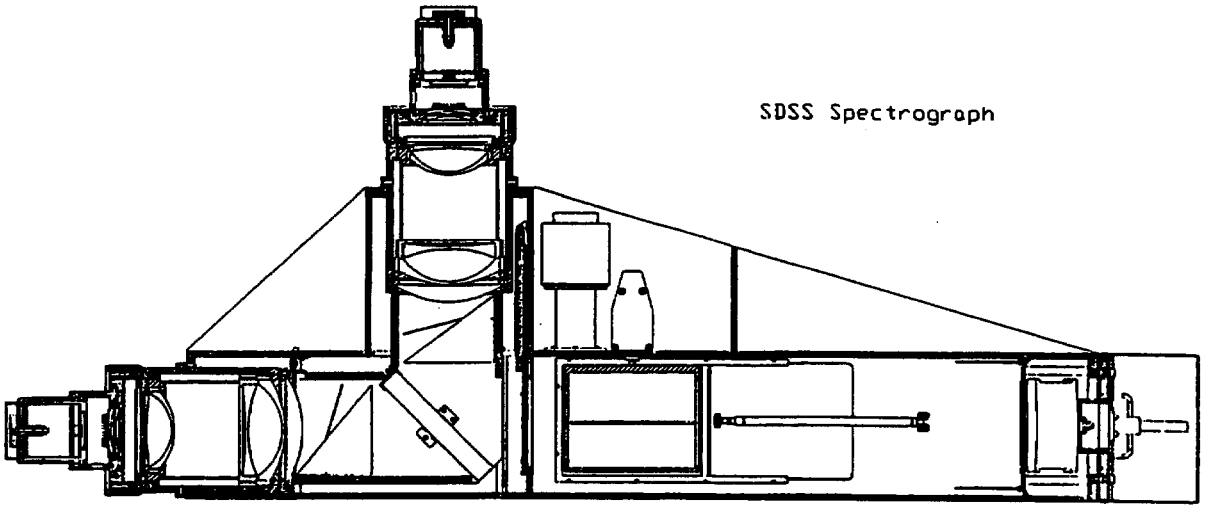


Figure 1

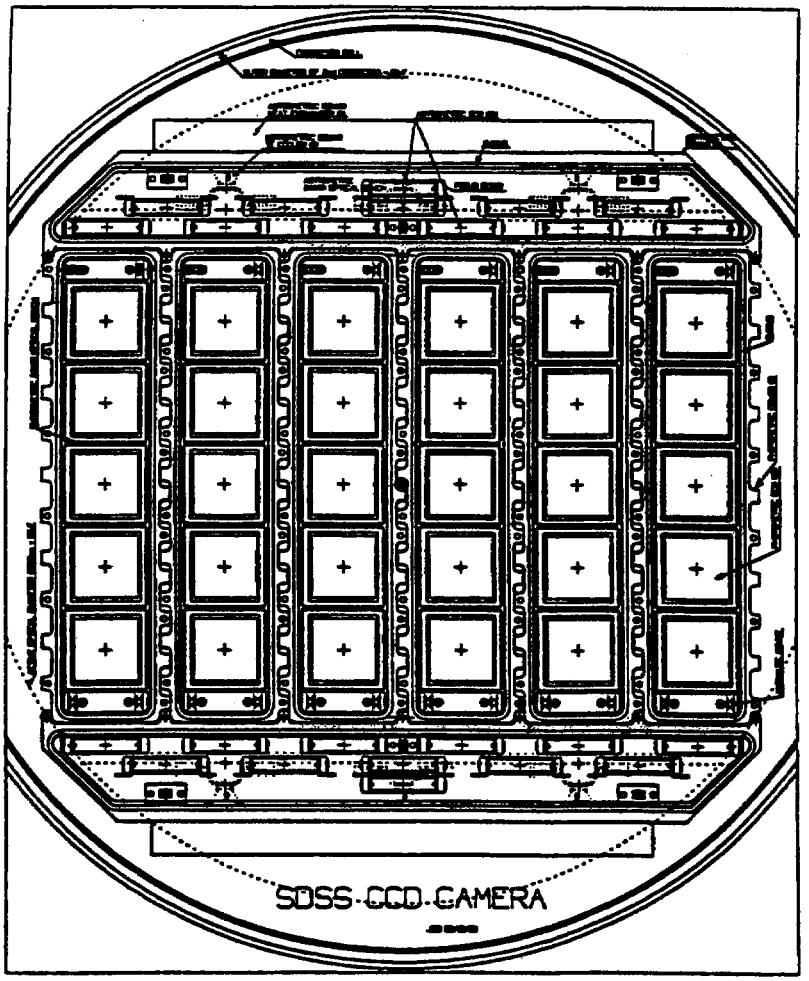


Figure 2

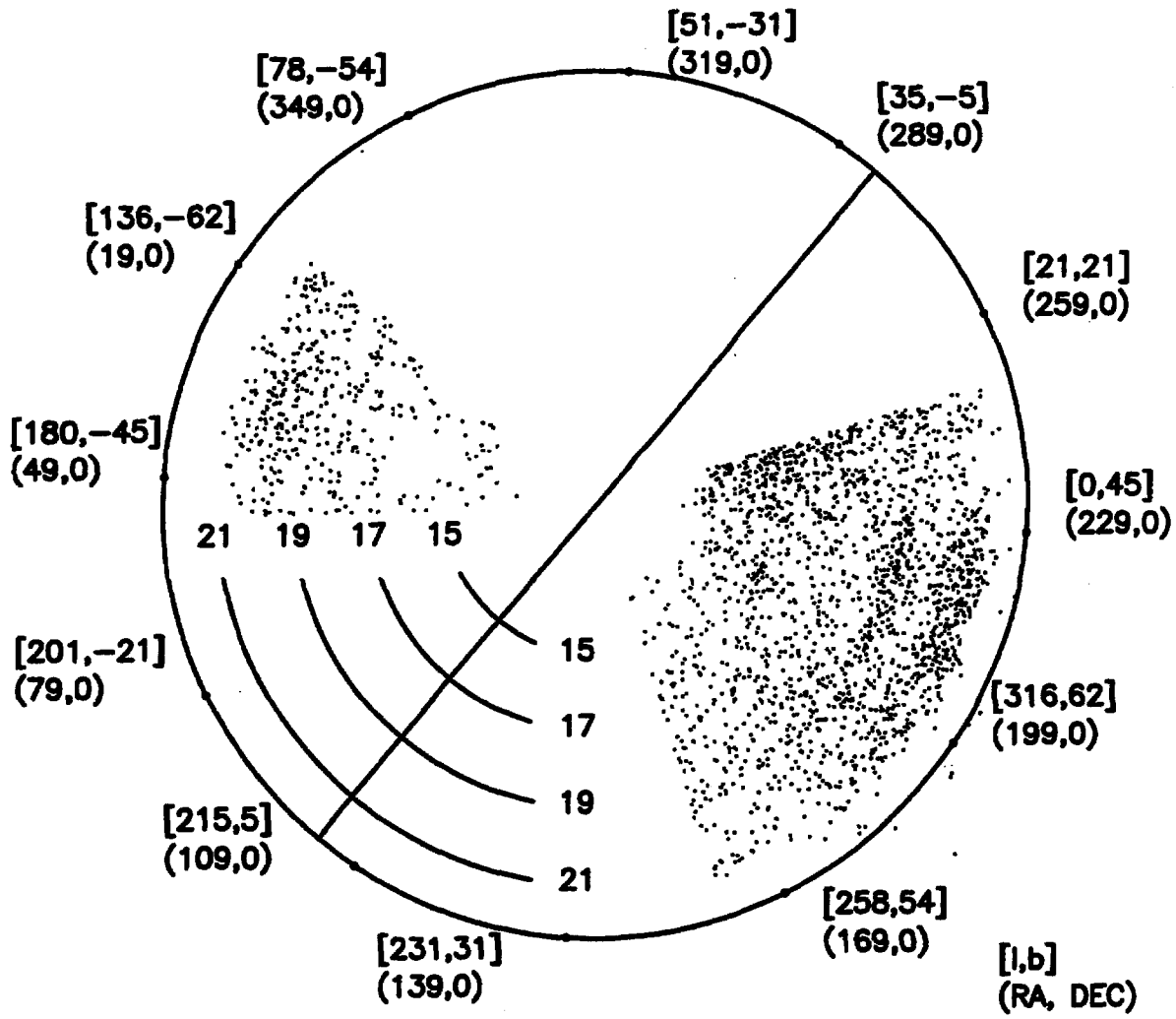
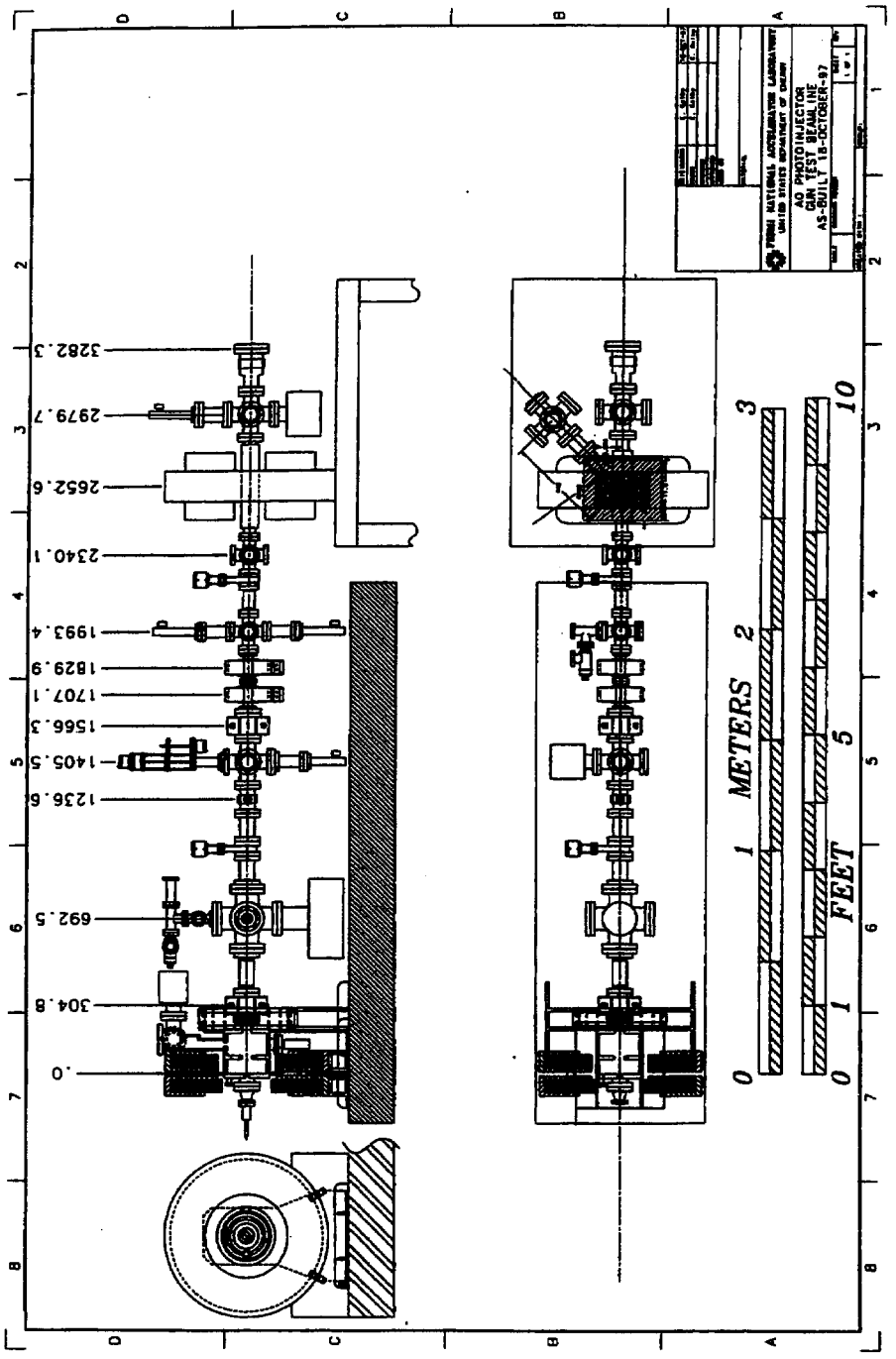


Figure 3. Distribution of Milky Way halo stars. The sun is at the center of the figure. The band of stars to the lower right may be tidal debris from a satellite galaxy.

E-886


AD PHOTOINJECTOR
GUN TEST BEAMLINE
AS-BUILT 18-OCTOBER-97
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304.8
692.5
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1829.9
1993.4
2340.1
2652.6
2979.7
3282.3
0 1 METERS 2 3
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E-886 (Melissinos) Experiments at the A0 Photoinjector

Fermilab, Rochester

Status: *Data-Taking*

The A0 photoinjector has been in operation throughout the year and several experiments have been completed. Typically the photoinjector is operated with 10-20 pulses of up to 8 nC of charge at an energy of 16 MeV and compressed to 4 ps in length.

The following experiments have been carried out:

1. Electro-optic measurements of the wake fields of the electron beam. This was the thesis topic of M. J. Fitch who successfully defended his dissertation in November.

2. Studies of the emittance of the electron beam, carried out mainly by J. P. Carneiro who will submit his thesis in the spring of 2001.

3. Production of flat beams such as needed for future e^+e^- colliders. Carried out by H. Edwards and collaborators.

4. Measurements of channeling in crystals carried out under the direction of R. Carrigan.

The projects discussed under 1, 2, and 4 are now complete.

Publications

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Electro-Optic Measurement of the Wake Fields of 16 MeV Electron Bunches, M. J. Fitch et al., Rochester UR-1585, FERMILAB-TM-2096 (1999).

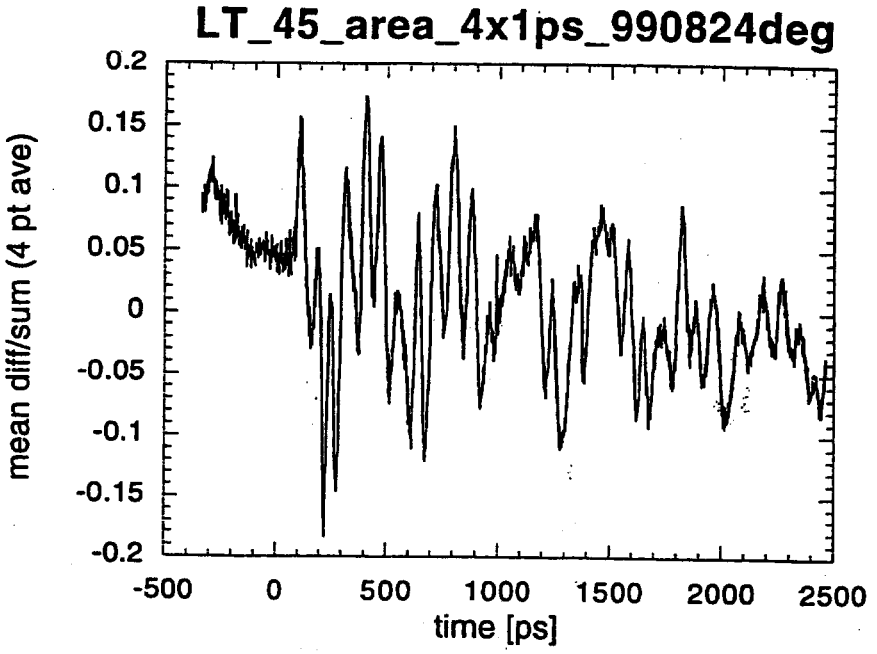


Figure 1. Optoelectronic measurements of the electron beam bunch length with picosecond resolution.

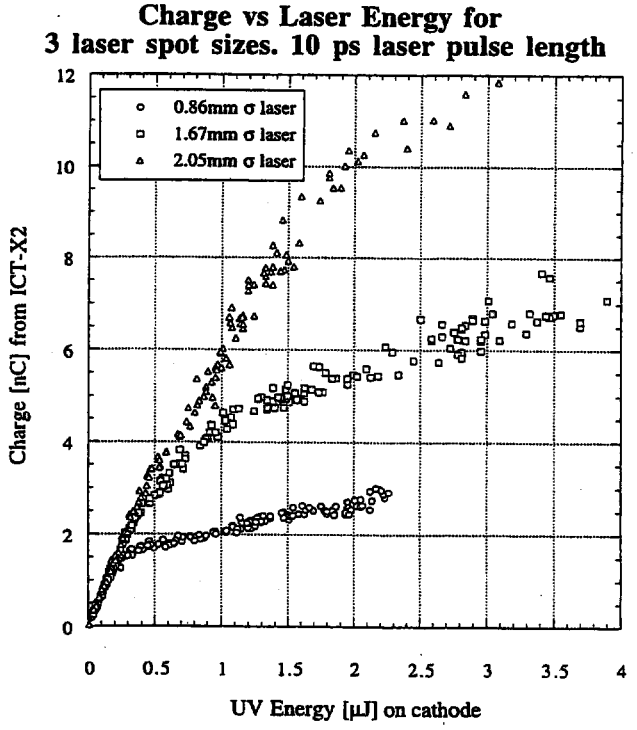


Figure 2. Charge versus laser energy for three different laser spot sizes. The effect of saturation from the space charge force is clearly seen as the laser spot size is reduced. All data were taken with the long (stacked) laser pulse which is 10 ps FWHM.

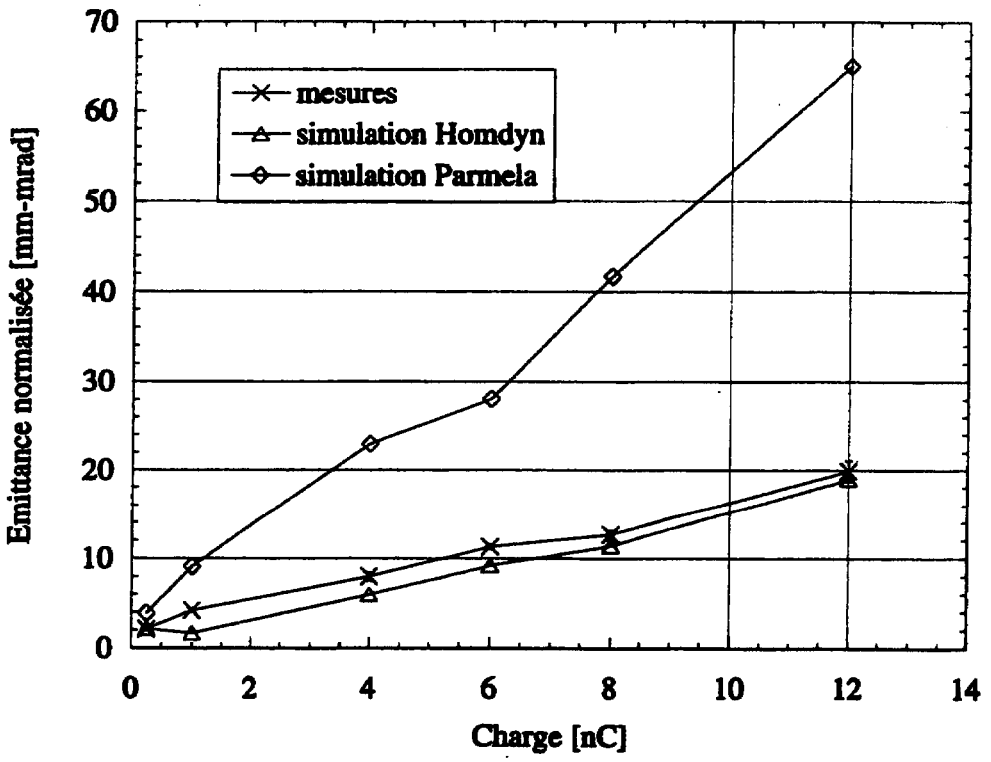
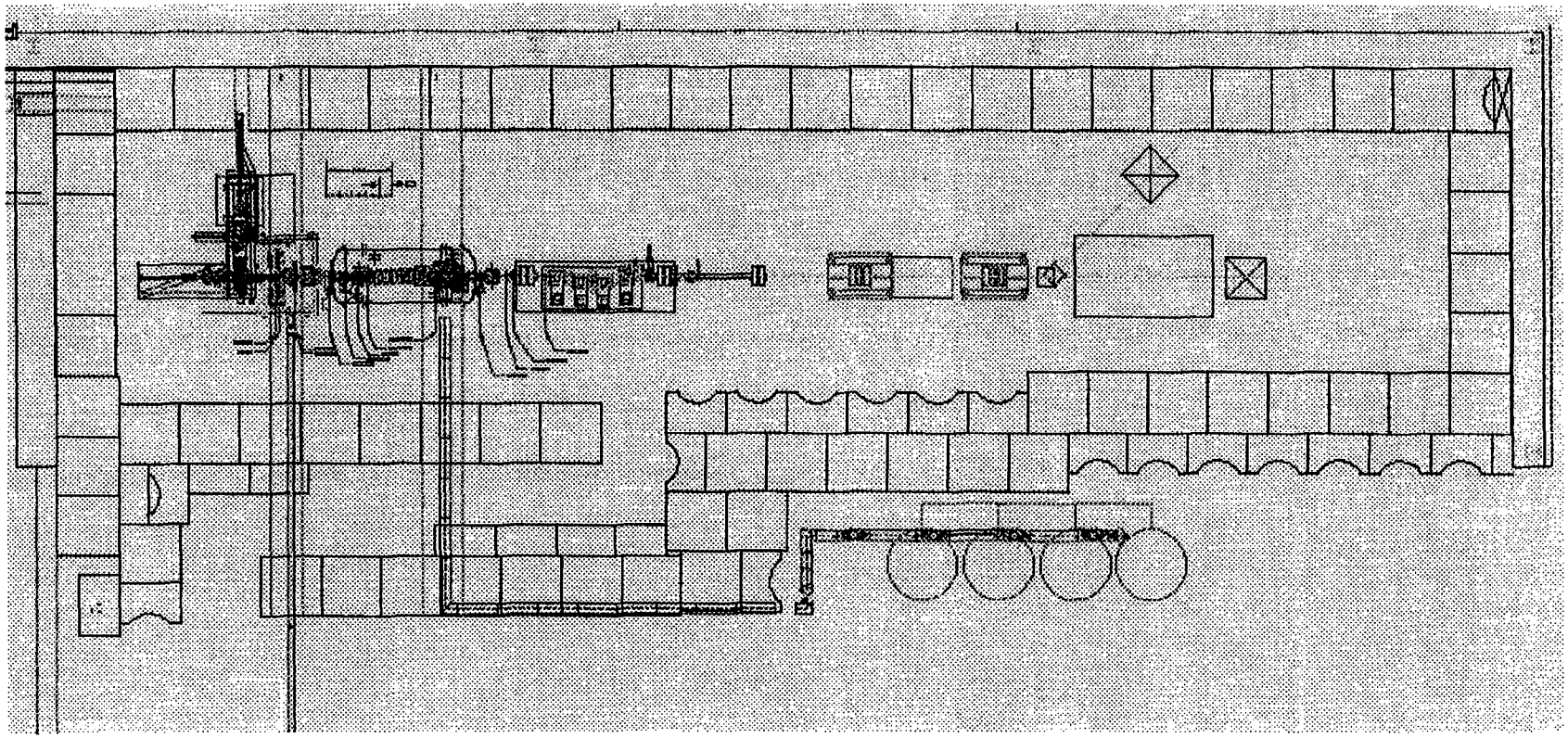


Figure 3. Measurement of the normalized transverse emittance at z = 3766 mm as a function of the charge.



Schematic diagram of the electron source facility. A laser-driven photocathode produces short electron bunches which are accelerated by a superconducting cavity. A magnetic chicane is used to compress the bunches longitudinally, which are then focussed into the experimental chamber.

E-890 (Rosenzweig) Plasma Wake-field Acceleration Experiment at the A0 Photoinjector

UCLA, Fermilab

Status: *Data-Taking*

This experiment seeks to excite a strong accelerating-mode plasma wave driven by an intense electron beam. The wave strength is probed by measuring the energy gained by a second test beam, appropriately delayed relative to the primary, or drive beam. As a test of advanced accelerator technology, this experiment has a dual purpose. The first is to excite a plasma wake-field having a gradient in the range of 0.5 - 1 GeV/m. The second is to demonstrate the suitability of a photoinjector-derived beam, particularly one from a relatively compact facility, as a driver for a plasma wake-field accelerator.

A crucial operating condition of this experiment is to achieve the underdense regime, where the density of the drive beam exceeds that of the plasma. The resulting charge imbalance drives all of the plasma electrons radially out of a region enclosing the drive beam, leaving behind only the plasma ions. Since the rarefied region is devoid of plasma electron currents, the electromagnetic fields there have excellent spatio-temporal characteristics. In particular, the focusing force seen by the test beam is linear, and the acceleration potential is independent of transverse position. These are conditions that we have come to expect, and also demand, of conventional accelerating devices.

The plasma wake-field mechanism has a very sharp scaling with the drive beam conditions, the field strength being proportional to the charge in the drive beam divided by the square of the bunch length. To this end, it is very important to be able to optimize bunch compression in the A0 photoinjector by tuning the magnetic dipole chicane. Preliminary results using a streak camera to measure the beam's temporal extent have yielded an RMS bunch length of σ_t = 3.5 ps with a charge of 10 nC. Although relatively little has been done to address the optimum operating point for the chicane, the above results already translate to a 300 MeV/m acceleration gradient in the plasma. It is hoped that further optimization of the compressor will push this number closer to the 1 GeV/m predicted by simulations.

Plasma acceleration gradients approaching the wave-breaking limit (about 1 GeV/m in our case) also offer the unique opportunity to study the mechanism of electron trapping in the wave from the background plasma. This is usually considered undesirable because it acts to dissipate the wave energy. However, recent theoretical results have explored the possibility of significantly enhancing this effect by providing a sharp discontinuity in plasma density as a function of longitude. Under these conditions, all of the

trapped electrons originate in a well-defined area in the plasma, in effect making up a separate beam, which can be accelerated to tens of MeV. This experiment will be adequately instrumented to detect the energy signature of a trapped beam.

A plasma chamber was constructed utilizing a directly heated tantalum cathode in a hollow cathode geometry. The working gas is argon, which is pulsed-fed into the system, and is then ionized with an arc discharge. The plasma chamber is followed by a broadband, high-resolution spectrometer magnet for diagnosis of the energy loss of the drive beam and energy gain of the test beam. The experiment was scheduled to begin May 1, 2000.

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2. N. Barov, M. E. Conde, W. Gai, and J. B. Rosenzweig, Phys. Rev. Lett. 80, 81 (1998).

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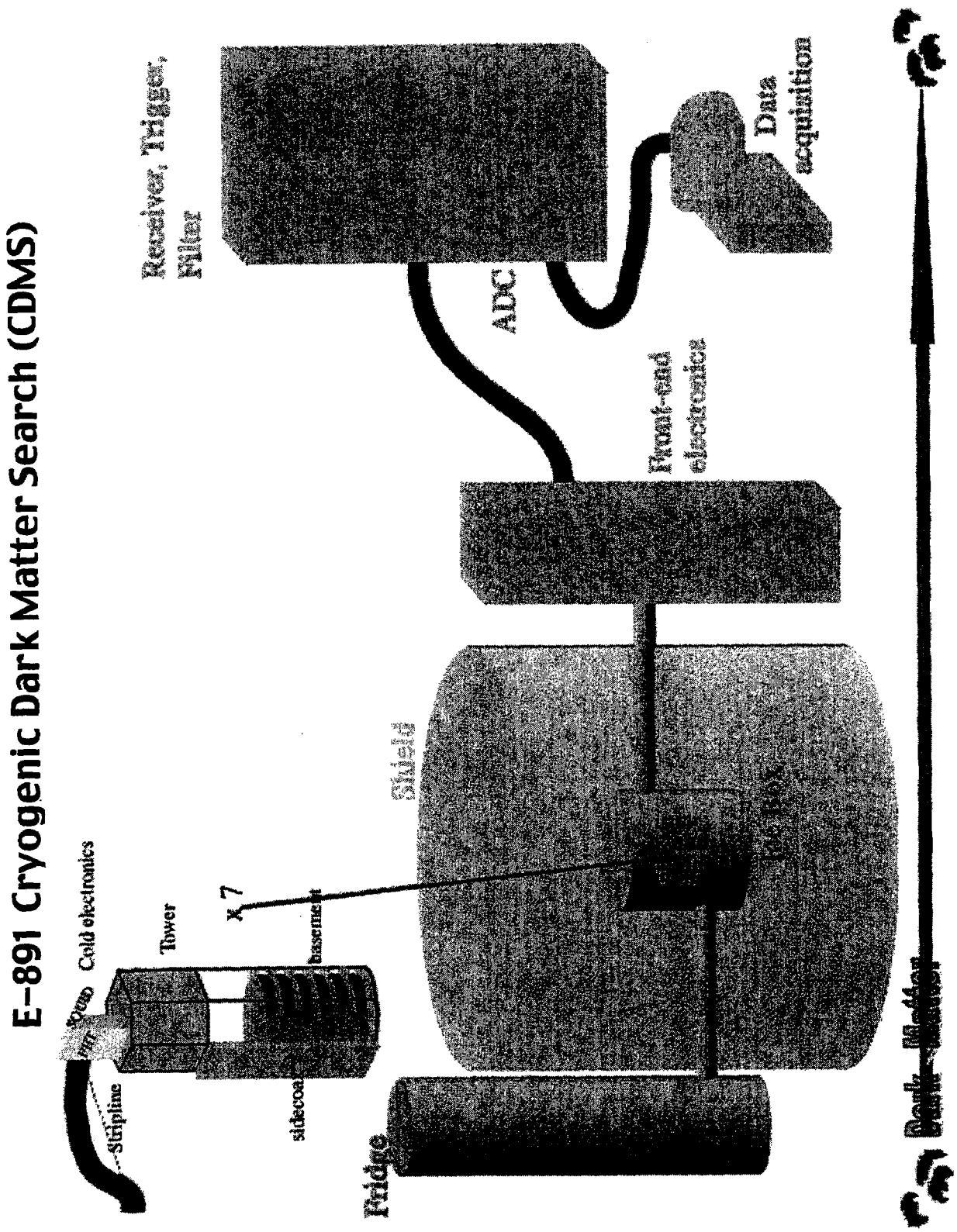

E-891 Cryogenic Dark Matter Search (CDMS)
Receiver, Trigger, Filter
Data acquisition
ADC
Front-end electronics
Shield
Fridge
Tower
Cold electronics
Stripline
basement
x 7

E-891 (Dixon) Cryogenic Dark Matter Search (CDMS)

Fermilab
(and UC/Berkeley, UC/Santa Barbara, Case Western Reserve, Colorado/Denver, LBNL, NIST/Boulder, Princeton, Santa Clara, Stanford, University College London [United Kingdom])

Status: *Data-Taking*

The CDMS collaboration is building a detector to search for cold dark matter. There are good reasons to believe that most of the matter in the universe is "seen" only gravitationally, and does not emit or absorb substantial amounts of electromagnetic radiation at any known wavelength. The nature of this "dark matter" is unknown. However, there is some evidence that suggests that the dark matter consists of as yet undiscovered weakly interacting massive particles (WIMPs) that were produced in the early universe. If this is true, then we are immersed in a sea of relic WIMPs which occasionally interact with atomic nuclei as they traverse the Earth. The direct observation of the interaction of WIMPs in a terrestrial detector would solve the "dark matter problem," enable the properties of the dark matter to be measured, and advance our understanding of the physics of elementary particles and the evolution of the early universe.

This experiment will be an upgraded version of the Cryogenic Dark Matter Search experiment (CDMS I) currently running at a shallow underground site on the Stanford campus. The CDMS experiment utilizes a new class of elementary particle detectors based on the propagation and detection of phonons in silicon or germanium crystals at temperatures below 0.1 K. CDMS is one of the first experiments capable of searching for WIMPs with properties and fluxes consistent with current expectations from particle physics and cosmology. CDMS II will be installed in the low background environment of the Soudan mine in Minnesota.

Status

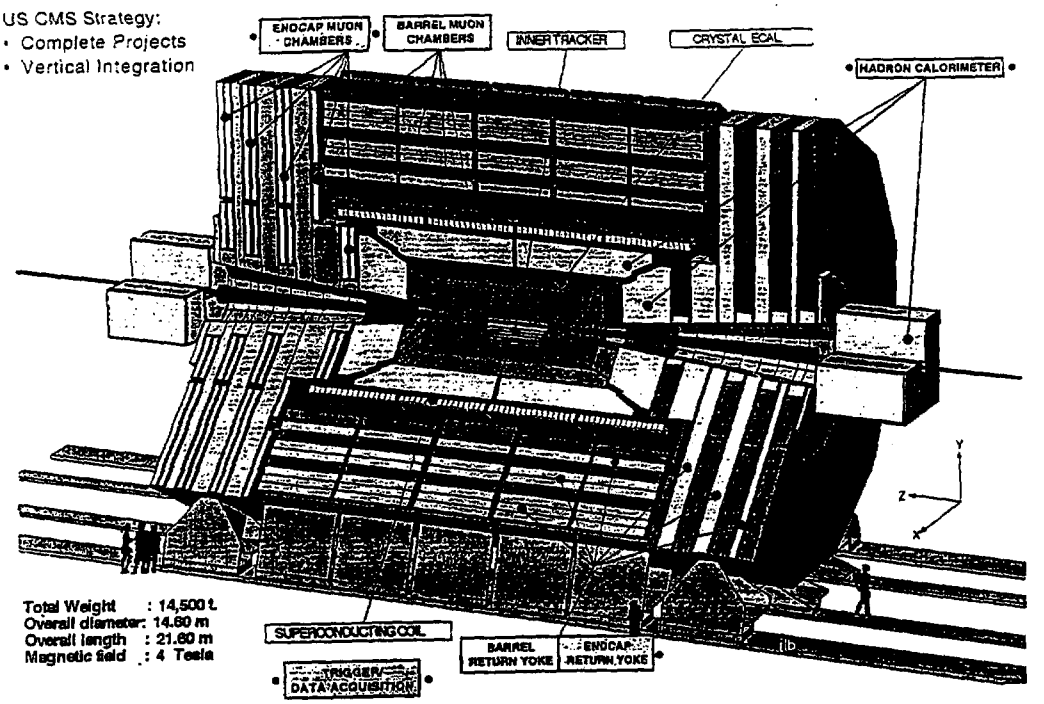
During 2000 the CDMS I experiment continued to run in the Stanford Underground Facility (SUF). This year the focus was on developing and testing the new ZIP detectors to be used in the Soudan installation. Further physics runs at SUF will take place in 2001.

Preparations continued for the installation of CDMS II in the Soudan Laboratory. The RF-shielded clean room was completed and assembly of the Pb and polyethylene shielding began. Assembly of the icebox also got underway. First detectors should arrive late in 2001.

E-892

US CMS Management Responsibilities

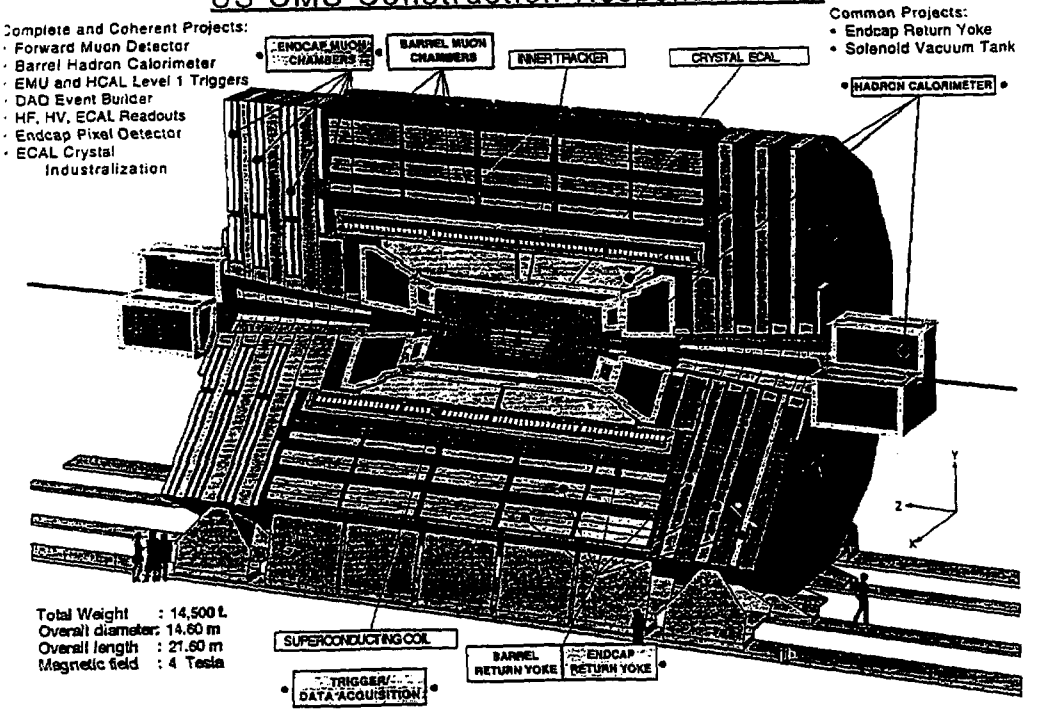
US CMS Strategy:
- Complete Projects
- Vertical Integration



US CMS Construction Responsibilities

Complete and Coherent Projects:
- Forward Muon Detector
- Barrel Hadron Calorimeter
- EMU and HCAL Level 1 Triggers
- DAQ Event Builder
- HF, HV, ECAL Readouts
- Endcap Pixel Detector
- ECAL Crystal Industrialization

Common Projects:
- Endcap Return Yoke
- Solenoid Vacuum Tank



E-892 / 919 (Green) The US CMS Collaboration at Fermilab

Fermilab
(and 35 other US institutions)

Status: *No Data Yet*

The Compact Muon Solenoid (CMS) is one of two high p_t experiments to be built at the CERN Large Hadron Collider (LHC). The primary physics goal of CMS is to explore electroweak symmetry breaking - the origin of mass. To that end, the basic philosophy of CMS is to enclose the tracking and calorimetry inside a strong Solenoidal magnet. This design allows for a Compact design allowing optimal Muon detection without compromise to the electromagnetic calorimetry because of inert material. In general CMS is optimized for electrons, photons, muons, neutrinos and jets. The Higgs decay modes imply an emphasis on lepton detection. At the high luminosities to be used at the LHC, the charged lepton of choice is the muon due to its relatively clean signature. Neutrinos and jets may also be used in higher-rate but also higher-background signatures, $H \rightarrow ZZ \rightarrow llvv$, $H \rightarrow WW \rightarrow jjlv$.

There are about 1800 physicists in the CMS Collaboration who plan to build the detector for a cost of around 475 M Swiss Francs. The detector is to be built from 1997 until data-taking in 2005. The composition of CMS is roughly 50% physicists from member states, 30% from Russia and other non-member states, and 20% US groups. The US CMS Collaboration consists of about 384 physicists and engineers from 36 institutions. The collective goal of this group is to pursue high energy physics at the energy frontier which will be available at CMS. We find the physics opportunities compelling.

Test beam data has been taken each year since 1995 by subgroups of US CMS involved in Hadron Calorimetry (HCAL), Endcap Muon Chambers (EMU), Electro-magnetic Calorimetry (ECAL) and Tracking. The Fermilab group is particularly active in HCAL, EMU and silicon strip tracking. All subsystems, except trigger/DAQ, have produced full Technical Design Reports, and most subsystems have fabricated preproduction prototypes. The CMS Fermilab group is heavily involved both in test beam R&D and in engineering design.

Fermilab has also accepted to act as the "host laboratory" for the US CMS collaboration. Therefore, Fermilab will provide a focal point for US CMS. The Project Management of US CMS is centralized and located at Fermilab. The intent is to utilize existing infrastructure at Fermilab for muon chamber construction, the production of calorimeter optical readout, the mechanical layout of tracking detectors, the pipelined electronic readout of all the HCAL devices, and the assembly of silicon strip detector arrays. In addition, the fact that Fermilab is the location of the US HEP hadronic collider program, means that the synergy between CDF and D0 upgrades and CMS design and

construction is available. For example, high-rate triggering and data acquisition is an area where Fermilab will contribute expertise to CMS.

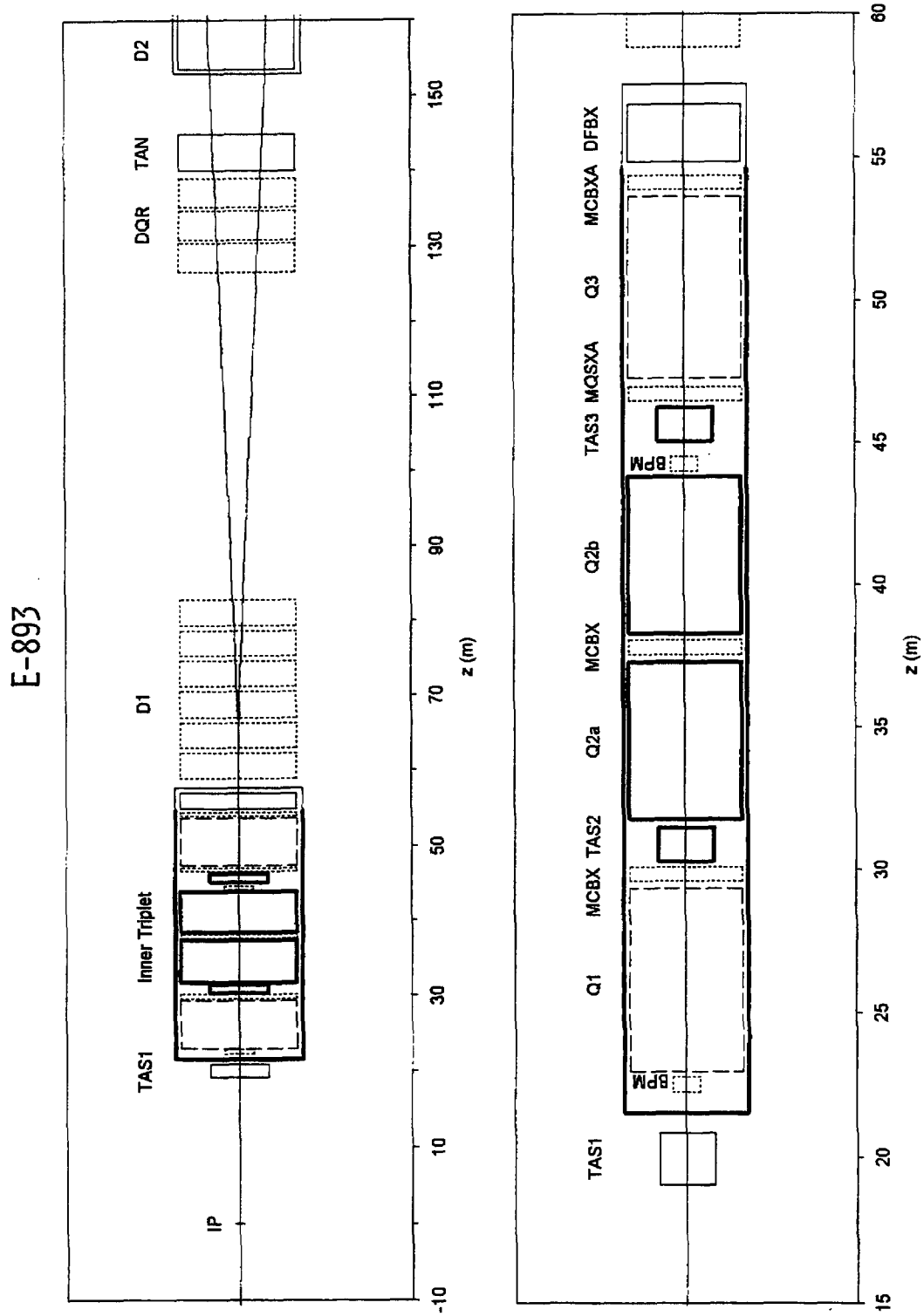
In turn, working on CMS will enhance the art of detector building in the US, especially in the demanding environment found in high-luminosity hadron colliders. The operational experience obtained at CDF and D0 is crucial in ensuring a realistic detector design for CMS. In addition, the use of Fermilab facilities by university groups, such as the facilities for silicon detectors being developed for the Run II collider program, represents a low-cost way for Fermilab to support university groups within the US CMS Collaboration. Recently, US CMS has added new groups who plan to produce silicon strip detectors for CMS.

Fermilab has considerable experience operating computing farms of workstations as a cost effective method of providing analysis power to CDF and D0. It is thought that this expertise will translate well to support of US CMS. Clearly, the decade-long experience of Fermilab in the running of the US hadron collider experimental program makes it a natural nucleation point. Fermilab aims to be a "regional computing center" for the analysis and distribution of CMS data for the US CMS collaboration.

Experience on existing hadron collider experiments at Fermilab and CERN and on the R&D associated with the SSC makes it possible for US physicists to have a major impact on the design of CMS. US physicists have been assigned distinct and coherent managerial and construction responsibilities as seen in the accompanying figures. We are the managers for HCAL, EMU, and the trigger system.

The US groups will also take proportional responsibilities for the costs of common projects, such as the solenoid. Specifically, US physicists have positions of responsibility for the solenoid vacuum vessel and the endcap steel return yoke. In addition, Fermilab will take responsibility for procurement of the conductor and stabilizing aluminum for the solenoid. The aim is ultimately to provide in-kind contributions to CMS bid and bought in the US.

The experiment is presently scheduled to commence in 2005. It will subsequently have at least a decade lifetime, LHC being at present the sole facility in the world capable of addressing the physics of the TeV mass scale. A Memorandum of Understanding (MOU) for CMS has been signed by US and CERN representatives which defines the US deliverables.



Block diagram of one half of an LHC interaction region (optics version 6.2). Fermilab-provided equipment is shown in bold outlines, that provided by other US national laboratories in light outlines, by KEK in dashed lines, and by CERN in dotted lines.

E-893 (Strait) Design and Construction of Interaction Regions at the CERN Large Hadron Collider (LHC)

Fermilab
(BNL, LBNL)

Status: *No Data Yet*

The US contribution to the construction of the Large Hadron Collider (LHC) at CERN consists of the design and fabrication of specialized equipment and the providing of technical support by three US national laboratories, Fermilab, Brookhaven National Laboratory (BNL) and Lawrence Berkeley National Laboratory (LBNL), and of providing CERN with agreed-upon products manufactured in the US. The contribution through the national laboratories, called the US LHC Accelerator Project, is the design and construction of the final focus systems for the four interaction regions IRs 1, 2, 5, and 8; superconducting beam separation-recombination dipoles for the RF straight section in IR4; production testing of the superconducting wire and cable for the main LHC magnets and technical support for the development and production of the cable for the main magnets; and accelerator physics calculations to support the design of the US-provided hardware and on other topics where the US has special expertise. Fermilab is working on the interaction regions and accelerator physics. Fermilab is also the lead laboratory for the Project: the Project Management Office is at Fermilab and the Fermilab Director is responsible for oversight of the Project.

The parameters of the Project are defined in the International Cooperation Agreement between CERN and the US DOE and its Accelerator Protocol, which were signed in December 1997, the Implementing Arrangement between the three US national laboratories and the LHC Project at CERN, which was signed in July 1998, and the US LHC Accelerator Project Management Plan, which was signed in October 1998. The Project Baseline was approved following the DOE baseline review in February 1998.

The layout drawing shows one half of an LHC interaction region. It consists of four strong (operating gradient up to 215 T/m), large-aperture (70 mm) superconducting quadrupoles (Q1-Q3), correction magnets (MCBX and MQSX), a cryogenic feed and lead box (DFBX), absorbers (TAS and TAN) to protect the superconducting magnets from particles resulting from the p-p collisions at the high luminosity interaction regions at IR 1 (ATLAS) and IR 5 (CMS), single-aperture (D1) and twin-aperture (D2) beam separation-recombination dipoles, and beam position monitors (BPM). (DQR is a dump resistor for the arc magnets.) The drawing shows the layout at IRs 1 and 5, where D1 is made from 6 conventional magnets. The layout at IRs 2 and 8 is the same except that D1 is a single superconducting magnet, D2 is 32 m closer to the IP, and the absorbers are absent. The components shown in the layout come from several sources. Half the quadrupoles are made by Fermilab and

the other half by KEK; the correction magnets, conventional D1, and the BPMs are provided by CERN; the DFBX, TAS1 and TAN are built by LBNL, the TAS2 and TAS3 are Fermilab's responsibility; and the superconducting D1 and D2 are built by BNL. Fermilab will build all of the quadrupole cryostats and will install all of the quadrupoles and associated correction coils into them. Fermilab is responsible for the overall system design and system integration of the inner triplet system, including the D1 when it is superconducting.

The high-gradient quadrupoles are among the most challenging magnets required for the LHC. Figure 1 is a cross-section of the magnet[1] currently under development at Fermilab. These magnets are required to operate at a gradient 50% higher than the low-beta quadrupoles in the Tevatron Collider. Their field quality must be excellent, with field errors less than 1 part in 10^4 within a radius of 17 mm. Tracking studies[2] carried out at Fermilab and BNL have shown that under collision conditions these quadrupoles are the main determinant of the dynamic aperture of the LHC. In addition, these magnets will be subject to substantial heating due to the interaction of secondary particles from p-p collisions at the interaction point. The development, construction and testing of these very challenging quadrupoles will ensure that Fermilab and the US HEP program remain at the cutting edge of superconducting accelerator magnet technology. Thus this project looks forward to machines beyond the LHC as well as to the LHC itself. In addition, these quadrupoles, or ones very much like them, can be used to upgrade the Tevatron Collider.

The R&D program for the high-gradient quadrupole is nearing completion. Nine model magnets, approximately 30% as long as the magnets required for LHC, have been built and tested[3]. The field quality of the last five models is accelerator quality[4], and the quench performance meets LHC requirements[5]. A full-length 5.5 m long prototype quadrupole, which will be installed in a full-scale prototype cryostat, is currently being assembled and will be tested in early 2001. A full-scale test of the heat exchanger system which will be used to cool the magnets to 1.9 K at 1 atm pressure was run at CERN starting during 2000 and demonstrated performance exceeding the LHC requirements. We are on track for delivery of the first inner triplet to CERN in 2003 and completion of deliveries by early 2005.

References

1. US LHC Accelerator Project Technical Design Handbook, February 1998, http://www-td.fnal.gov/LHC/UsLhc_accel_docs/USLHCPublic/USLHC_TDH.pdf.

2. J. Wei, W. Fischer, V. Ptitsin, R. Ostojic, J. Strait, Interaction Region Local Correction for the Large Hadron Collider, presented at PAC 1999, New York; N. Gelfand, A Calculation of the Dynamic Aperture of the LHC, presented at PAC 1999, New York.

3. N. Andreev at al., Status of the LHC Inner Triplet Quadrupole Program at Fermilab, presented at the 2000 Applied Superconductivity Conference, September 2000, Virginia Beach, VA.

4. N. Andreev et al., Field Quality in Fermilab-built Models of Quadrupole Magnets for the LHC Interaction Region, presented at the 2000 Applied Superconductivity Conference, September 2000, Virginia Beach, VA.

5. N. Andreev et al., Quench and Mechanical Performance for Fermilab Model Magnets for the LHC Inner Triplet Quadrupoles, presented at the 2000 Applied Superconductivity Conference, September 2000, Virginia Beach, VA.

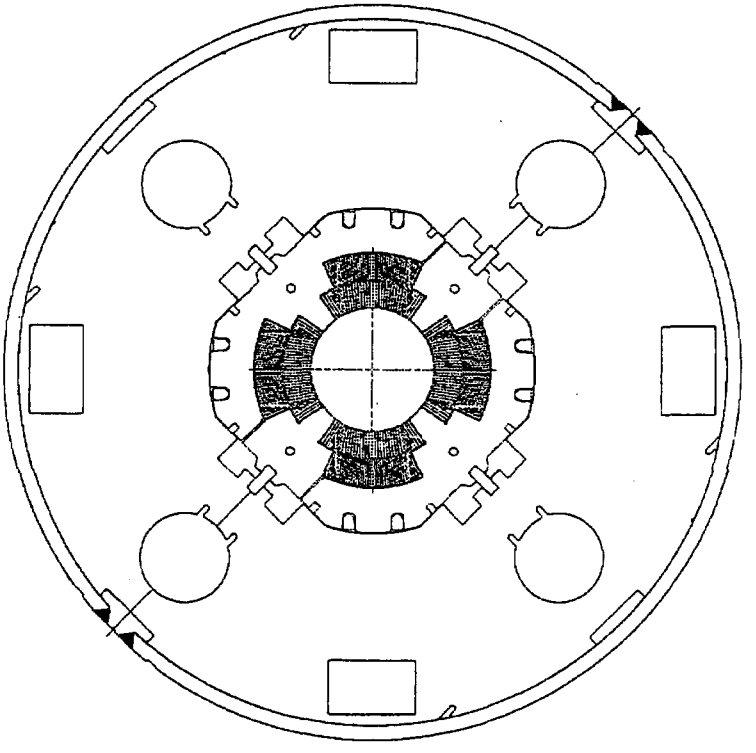
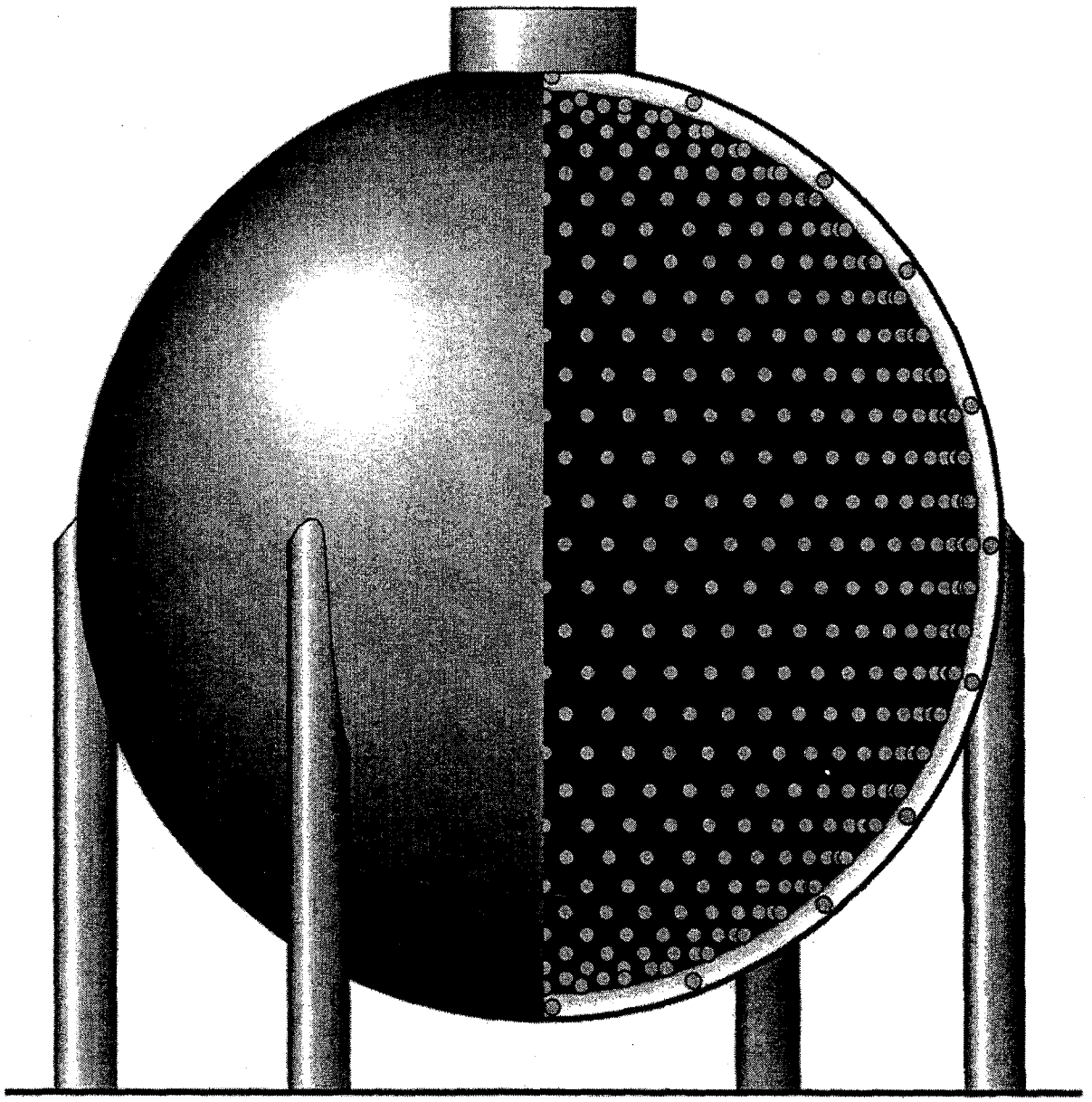


Figure 1. Cross-section of the LHC interaction region quadrupole under development at Fermilab.

E-898



Schematic drawing of the BooNE spherical tank

E-898 (Conrad / Louis) Booster Neutrino Experiment

Alabama, Bucknell, UC/Riverside, Cincinnati, Columbia, Embry Riddle, Fermilab, Indiana, LANL, Louisiana State, Michigan, Princeton

Status: *No Data Yet*

The MiniBooNE experiment is motivated by the LSND observation, which has been interpreted as $\bar{\nu}_\mu \rightarrow \bar{\nu}_e$, and by the atmospheric neutrino deficit which may be ascribed to ν_μ oscillations. MiniBooNE is a single detector experiment designed to: obtain ~1000 events per year if the LSND signal is due to $\nu_\mu \rightarrow \nu_e$ oscillations, establishing the oscillation signal at the ~8σ level; extend the search for $\nu_\mu \rightarrow \nu_e$ oscillations significantly beyond what has been studied previously if no signal is observed; search for ν_μ disappearance to address the atmospheric neutrino deficit with a signal that is a suppression of the reconstructed 500,000 $\nu_\mu C \rightarrow \mu N$ events per year; and test CP violation in the lepton sector if oscillations are observed by running with separate ν_μ and $\bar{\nu}_\mu$ beams.

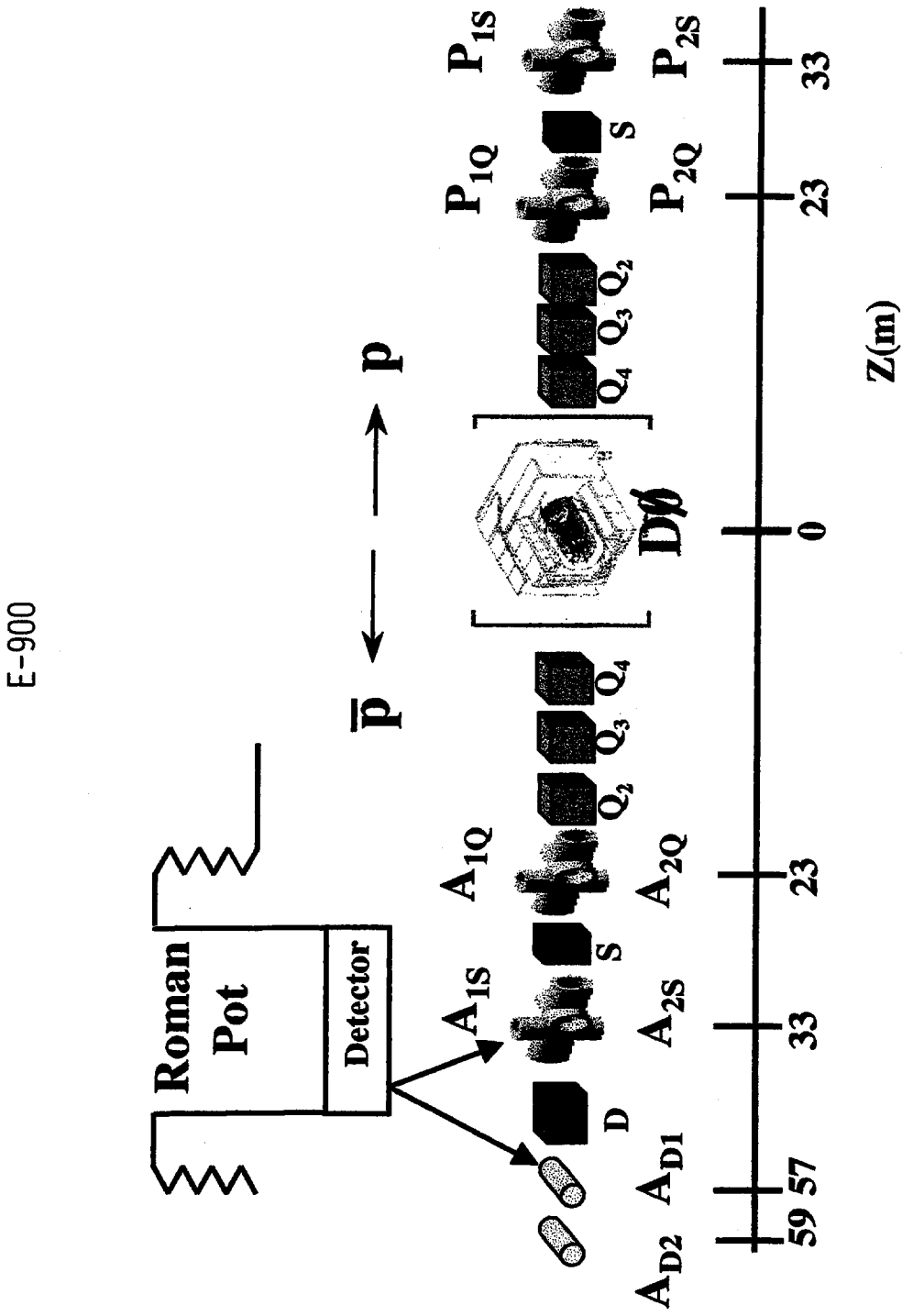
The detector will consist of a spherical tank 20 feet in radius, as shown in the accompanying figure. An inner structure at 5.5 m radius will support 1280 8-inch phototubes (10% coverage) pointed inward and optically isolated from the outer region of the tank. The vessel will be filled with 769 t of mineral oil, resulting in a 445 t fiducial volume. The outer volume will serve as a veto shield for identifying particles both entering and leaving the detector, with 240 phototubes mounted on the support structure facing outwards. The detector will be located 500 m from the Booster neutrino source.

The neutrino beam, constructed using the 8 GeV proton Booster at Fermilab, will consist of a target within a focusing system, followed by a ~50 m-long pion decay volume. The low-energy, high-intensity and 1μs time-structure of a neutrino beam produced from the Booster beam are ideal for this experiment. The Booster is a highly reliable machine, with a downtime of ~1.5%, thus we assume that the Booster can reliably deliver protons for a typical run which is two-thirds of a calendar year. The sensitivities discussed above assume the experiment receives 5 Hz for 2×10^7s running at 5×10^{12} protons per pulse. This Booster experiment is compatible with the Fermilab Collider and Main Injector programs. The Booster must run at 7.5 Hz to accommodate the MiniBooNE, NuMI and Collider programs simultaneously. The Fermilab Booster is capable of running at 15 Hz.

The civil construction for the detector enclosure has been completed, and the detector should be operational by November 2001. In addition, all of the detector design issues have been properly addressed. Exhaustive tests have been made of paints and other materials that will be used inside the tank, so that there is now confidence that MiniBooNE will avoid any minor contamination problems. A full-scale mockup of a portion of the PMT support

structure has been constructed and is being used to test the installation procedure. The LSND PMTs were shipped to Fermilab and have all been tested. PMT mounting will begin in February 2001.

Civil construction for the Target Hall and 8-GeV beamline has begun and should be finished by the summer of 2001. The conceptual design of the horn, horn power supply, and target has been completed, and prototype tests of all three will be performed in March 2001. At present, all aspects of the experiment are on schedule for the start of data-taking in December 2001.


E-900
Roman Pot
Detector
$\bar{p}$
p
A_{1S}
A_{1Q}
A_{2Q}
A_{2S}
A_{D1}
A_{D2}
D
S
Q_2
Q_3
Q_4
P_{1S}
P_{1Q}
P_{2Q}
P_{2S}
Dø
59
57
33
23
0
23
33
Z(m)

E-900 (Weerts / Womersley) Forward Proton Detector at D0

Acad. Sci. (Czech Rep.), Amsterdam/NIKHEF (Netherlands), los Andes (Colombia), Arizona, BNL, Boston, Brown, Buenos Aires (Argentina), UC/Berkeley & LBNL, UC/Irvine, UC/Riverside, CBPF (Brazil), Charles (Czech Rep.), CSU/Fresno, Czech Tech (Czech Rep.), CINVESTAV (Mexico), Columbia, Delhi (India), Estadual Paulista (Brazil), Fermilab, Florida State, Grenoble (France), IHEP/Beijing (China), IHEP/Protvino (Russia), Illinois/Chicago, Imperial College (United Kingdom), Indiana, INP/Krakow (Poland), Iowa State, ITEP (Russia), JINR (Russia), Kansas, Kansas State, Lancaster (United Kingdom), Langston, LMU Munich (Germany), Louisiana Tech, Mainz (Germany), Manchester (United Kingdom), Marseille (France), Maryland, Michigan, Michigan State, Moscow State (Russia), Nebraska, Nijmegen (Netherlands), Northeastern, Northern Illinois, Northwestern, Notre Dame, Oklahoma, Orsay (France), Panjab (India), Paris VI and VII (France), PNPI (Russia), Rice, Rio de Janeiro (Brazil), Rochester, Saclay (France), San Francisco de Quito (Ecuador), SUNY/Stony Brook, Tata (India), Texas/Arlington, Virginia, Washington

Status: *No Data Yet*

The Forward Proton Detector[1] consists of momentum spectrometers which make use of accelerator magnets along with points measured on the track of the scattered proton (or anti-proton) to calculate the track momentum and scattering angle. Tracks are measured using scintillating fiber detectors (read out by multi-channel phototubes) located in Roman pots, which are stainless steel containers that allow the detectors to function outside of the machine vacuum but close to the beam. Particles traverse thin steel windows at the entrance and exit of each pot. The pots are remotely controlled and can be moved close to the beam (within a few mm) during stable beam conditions and retracted otherwise.

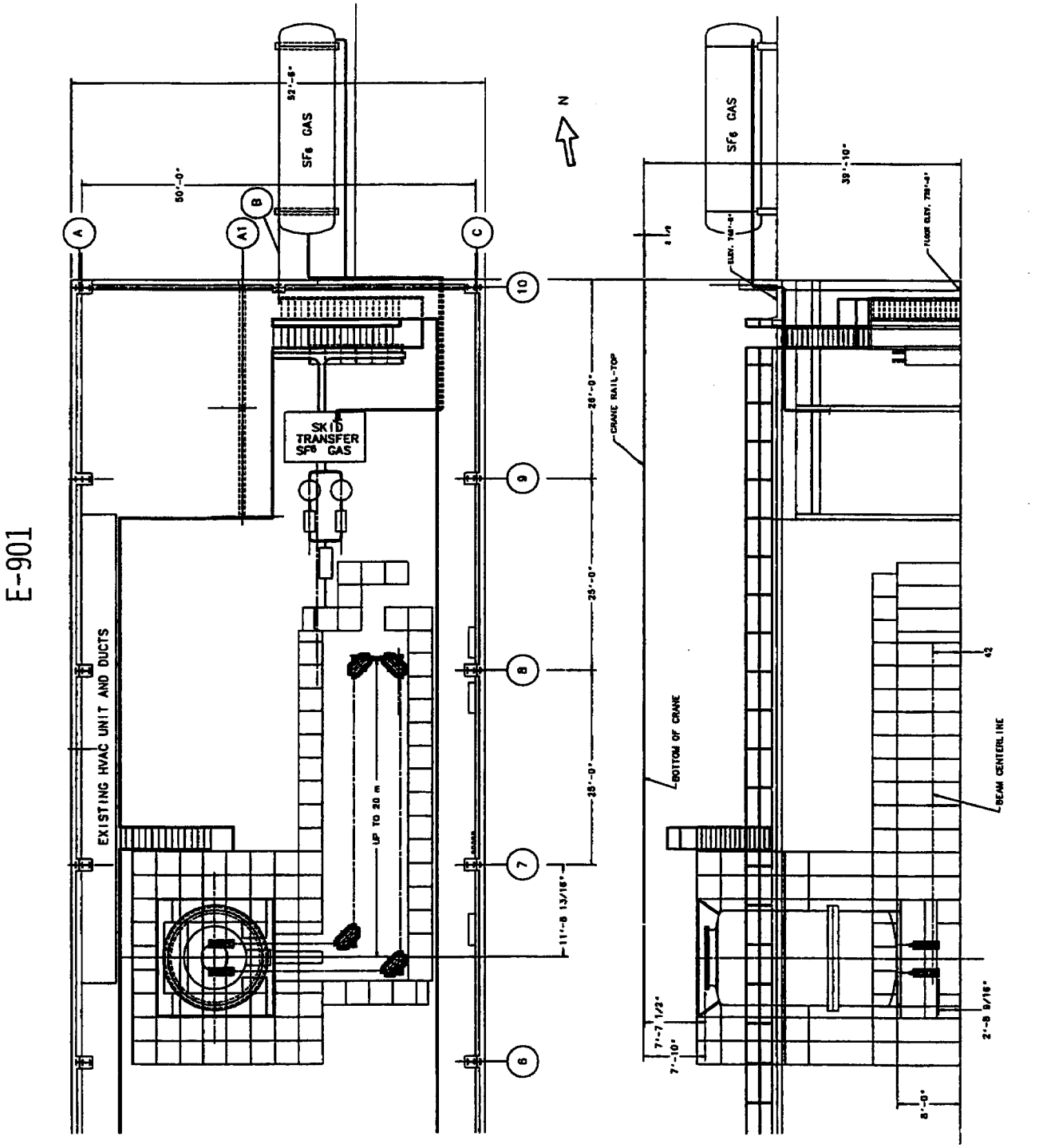
The figure shows the proposed location of the 18 Roman pots that will comprise the Forward Proton Detector. The dipole spectrometer consists of two Roman pot detectors located after the bending dipoles (D) about 57 meters downstream of the interaction point on the outgoing $\bar{p}$ arm and measures anti-protons of all angles that have lost a few percent of the beam momentum. The Roman pots comprising the quadrupole spectrometers are located adjacent to the electrostatic separators (S) on both the proton (P) and anti-proton (A) sides and use the low-beta quadrupoles (Q) as the primary analyzing magnets. They have acceptance for a large range of proton ($\bar{p}$) momenta and angle.

Events with a leading proton comprise about 40% of the total cross section and are typically described by the exchange of a color-singlet pomeron, about which little is known. The addition of the FPD to the D0 detector facilitates studies of the structure of the pomeron and its dependence on diffractive mass and momentum transfer, determination of the quark and gluon content of the pomeron, search for diffractive production of heavy objects such as W bosons, and studies of hard double pomeron exchange. The combination of the proton tagging and measurement of the FPD, the powerful D0 detector (E-823) which measures the hard scattering, and the large center-

of-mass energy available at the Tevatron will allow unprecedented measurements of hard diffractive scattering.

Reference

1. Proposal for a Forward Proton Detector at D0, D0 Collaboration, Fermilab proposal P-900, FERMILAB PUB-97/377.


E-901
SF6 GAS
SF6 GAS
SKID TRANSFER SF6 GAS
EXISTING HVAC UNIT AND DUCTS
UP TO 20 m
CRANE RAIL-TOP
BOTTOM OF CRANE
BEAM CENTERLINE
N
50'-0"
52'-8"
30'-10"
25'-0"
25'-0"
25'-0"
11'-8 13/16"
7'-7 1/2"
7'-10"
2'-8 9/16"
8'-0"
A
A1
B
C
10
9
8
7
6

E-901 (Nagaitsev) Recycler Medium Energy Electron Cooling Experiment

Fermilab, Indiana, JINR (Russia), Rochester, TJNAF

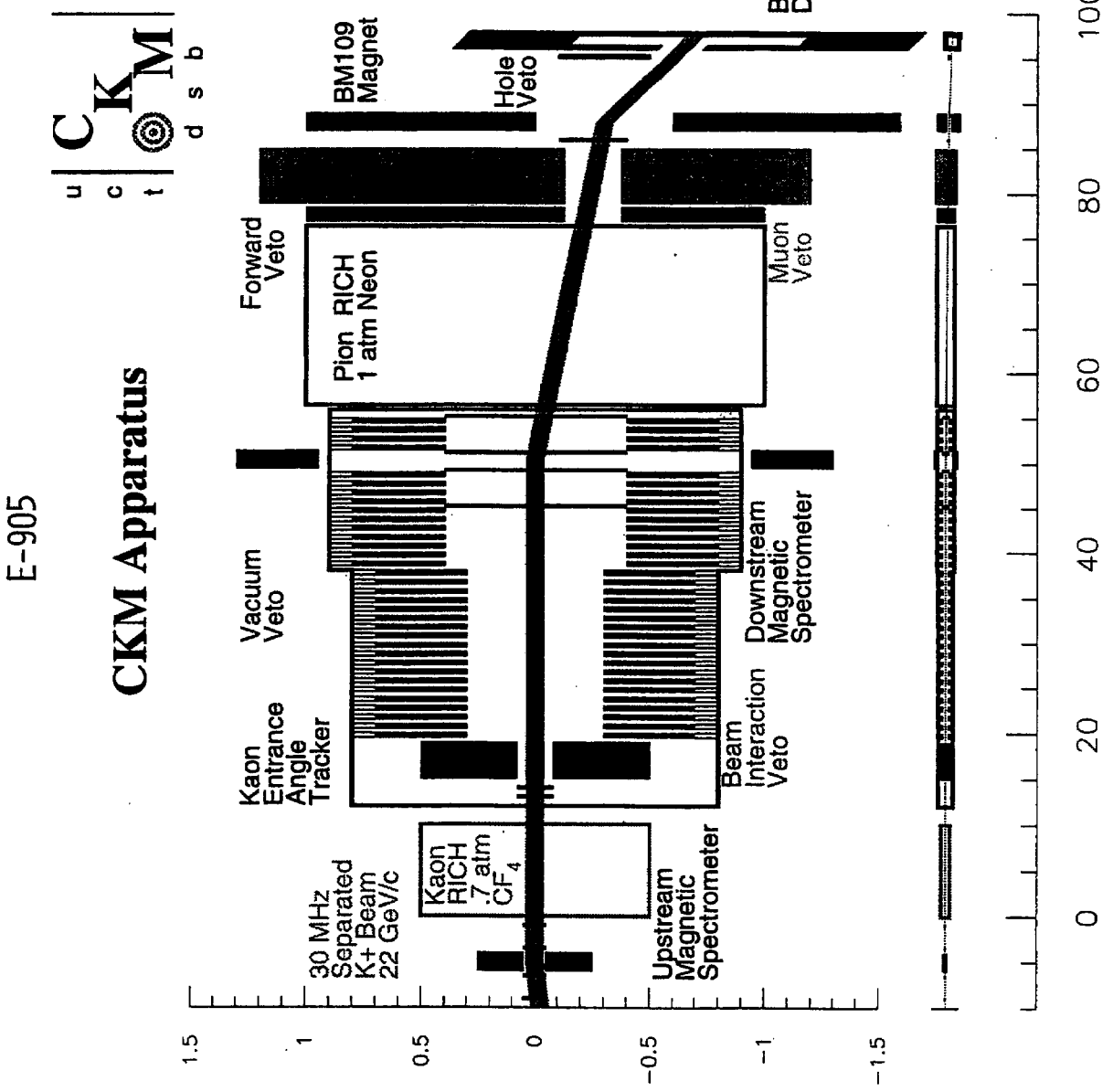
Status: *No Data Yet*

The purpose of this experiment is to study the technical issues surrounding the implementation of electron cooling in the Recycler. A 5-MeV kinetic energy Pelletron accelerator will be constructed and operated to perform this research.

The research will be concentrated on the effects of solenoidal magnetic field and high beam currents on beam recirculation stability. A layout of the Pelletron installation is shown in the accompanying figure. It is approximately 24 ft long and 12 ft in diameter. Associated with the Pelletron is an SF_6 gas handling system composed of vacuum pumps, dryers, compressors, and heat exchangers. The high-voltage terminal is charged to 5 MV using a charging chain system.

The plan is to have an accelerator installed and operated in a radiation enclosure. At the Wideband Photon Laboratory (WPL), the floor of the experimental pit is sufficiently shielded and interlocked. An additional safety concern is the oxygen deficiency hazard posed by the heavy and inert SF_6 gas used as a dielectric in the Pelletron. If a leak occurred, approximately 8,300 cu ft of air would be displaced at the floor of the enclosure housing the Pelletron.

It is expected that this experiment will run until electron cooling has been installed in the Recycler itself. At present, the beginning of calendar year 2002 is the anticipated date for this transition.


E-905
CKM Apparatus
u c t
C K M
d s b
30 MHz Separated K+ Beam 22 GeV/c
Kaon Entrance Angle Tracker
Vacuum Veto
Kaon RICH .7 atm CF_4
Forward Veto
Pion RICH 1 atm Neon
BM109 Magnet
Hole Veto
Beam Interaction Veto
Upstream Magnetic Spectrometer
Downstream Magnetic Spectrometer
Muon Veto
Beam Dump
1.5
1
0.5
0
−0.5
−1
−1.5
0
20
40
60
80
100

E-905 (Cooper) CKM R&D

BNL, Fermilab, IHEP/Protvino (Russia), Michigan, San Luis Potosi (Mexico), Texas/Austin, Virginia

Status: *In Progress*

CKM (**C**harged **K**aons at the **M**ain Injector) is a proposed experiment to measure the branching ratio of the ultra-rare charged kaon decay $K^+ \to \pi^+\nu\bar{\nu}$ by observing a large sample of these decays ($\approx$ 100) with small background ($<$ 10). The physics goal is to measure the magnitude of the Cabibbo, Kobayashi, Maskawa matrix element V_{td} with a statistical precision of about 5%. We have been approved as an R&D effort to develop a detector and beamline that will achieve this goal.

This measurement will play a critical role in testing the Standard Model hypothesis that the sole source of CP violation in nature resides in a single non-trivial imaginary phase of the Cabibbo, Kobayashi, Maskawa matrix. Attacking this question by studying kaon decays is independent of the ongoing programs to measure these same parameters in B meson decays. Each sector provides an independent measurement of the Standard Model parameters of CP violation. Both must agree for that description to be correct. Such a parallel approach is critical to confirm, with confidence, both the Standard Model description of CP violation and the veracity of the individual measurements. The $K^+ \to \pi^+\nu\bar{\nu}$ decay mode is regarded as the theoretically cleanest laboratory in which to measure the magnitude of V_{td}. The only significant uncertainty in the relationship between the branching ratio and $|V_{td}|$ is a small contribution from the charmed quark which depends upon the poorly known charmed quark mass.

Evidence for this decay mode has recently been published by experiment E787 at Brookhaven National Laboratory (BNL). They reported the observation of one event with an expected background of 0.08±0.03 events and quote a branching ratio consistent with the current Standard Model prediction of $[0.9\pm0.3] \times 10^{-10}$ with an appropriately large statistical uncertainty.

The measurement is clearly challenging. We require that the apparatus control all backgrounds to less than 10^{-11} of all K^+ decays. To achieve a two order of magnitude increase in sensitivity while maintaining control of the background requires an apparatus with much higher rate capabilities than has been achieved in the BNL experiment. This leads us to propose a decay-in-flight experiment in contrast to the stopped-kaon technique used at BNL.

In addition to the primary goal of measuring the $K^+ \to \pi^+\nu\bar{\nu}$ branching ratio, we plan a series of other measurements of rare charged-kaon decay properties using the CKM apparatus. The high rate capabilities and

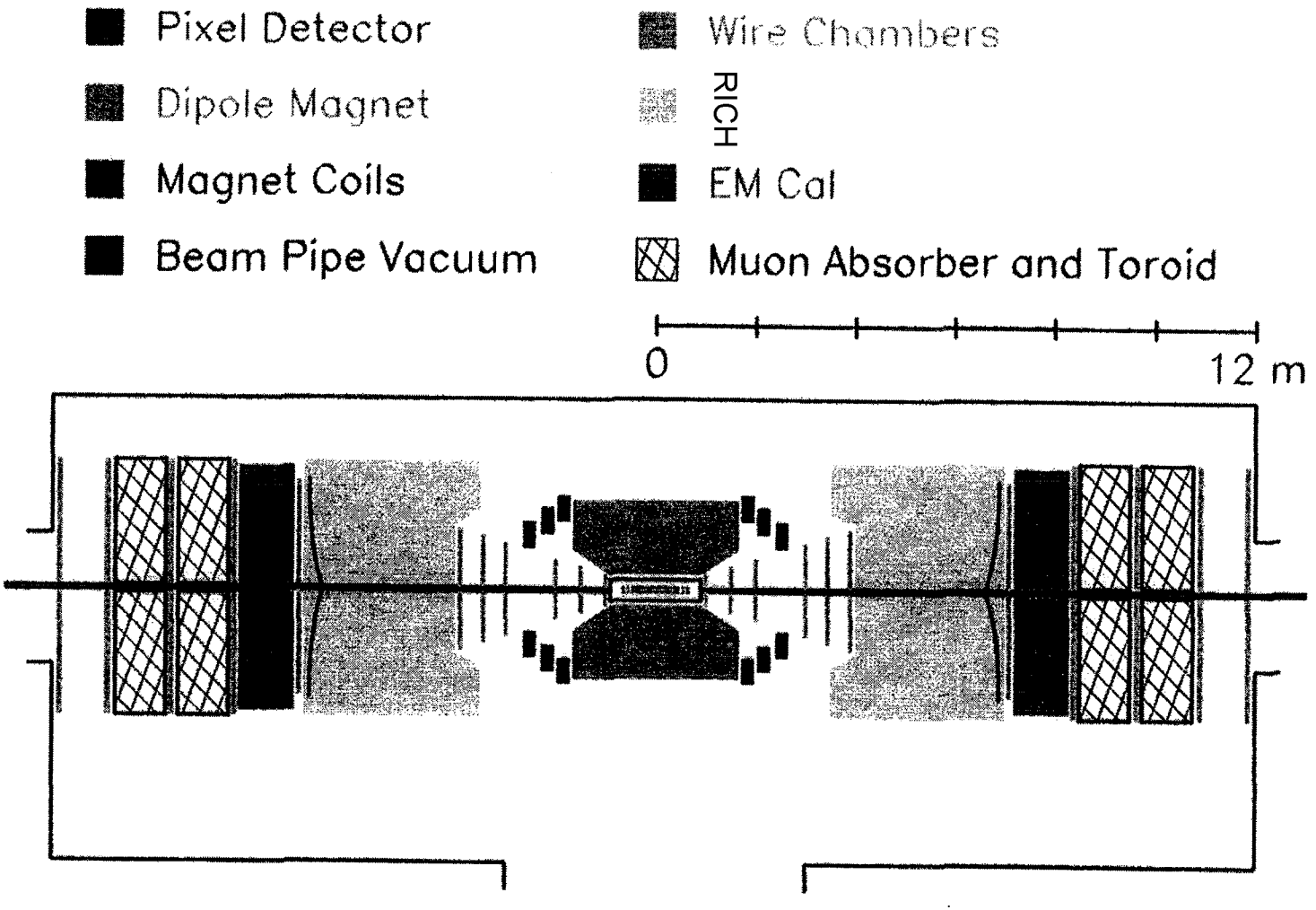
redundant measurement capabilities of the CKM spectrometer will make it well suited to such a program of measurements.

The experimental apparatus is shown in the figure. We will use well-established detector technologies with redundant measurements made for charged particles. The magnetic spectrometers, based upon low-mass multi-wire proportional counters and straw tube chambers, measure the incident kaon and daughter charged-pion trajectories. We will use two phototube-based RICH detectors as velocity spectrometers for these particles. The remainder of the experiment is a veto for photons and muons. All of these vetos will be constructed of scintillator sandwiched between lead or steel and will have phototube readout. Timing measurements will be made for all detector signals coming from the experiment.

The beamline design calls for delivery of a high (30 MHz) rate of K^+ particles at 22 GeV/c momentum, with a contamination of less than 30%. The K^+ separators are based on high-field superconducting RF cavities operating at 3.9 GHz in a deflecting mode. These cavities are being developed in an R&D project based in the Beams Division.

The CKM R&D project is doing design studies and detector development for the various subsystems. The high priority activities include a prototype demonstration of photon vetos which achieve the design inefficiency requirements and a working example of a straw tube plane which can operate in a vacuum. We plan to submit a full technical proposal to the Laboratory in 2001 and hope to begin construction of the experiment in FY 2003.

BTeV: Horizontal Section at y=0



E-918 (Butler / Stone) A Measurement of Mixing, CP Violation and Rare Decays in Charm and Beauty Particle Decays at the Fermilab Collider - BTeV

UC/Davis, Colorado, Fermilab, Florida, Houston, IHEP/Protvino (Russia), IIT, Illinois, Indiana, INFN/Milano (Italy), Iowa, Minnesota, Nanjing (China), New Mexico State, Ohio State, INFN/Pavia (Italy), Pennsylvania, Puerto Rico/Mayaguez, USTC (China), Shandong (China), Southern Methodist, SUNY/Albany, Syracuse, Tennessee, Tufts, Valparaiso, Vanderbilt, Wayne State, Wisconsin, Yale, York (Canada)

Status: *No Data Yet*

BTeV, which received approval in July 2000, will study CP violation, mixing and rare decays in the b and c quark systems using 2 TeV proton-antiproton collisions with a forward spectrometer located in the C0 interaction region.

We live in a world composed almost completely of matter. Current theories that address the origin of the Universe, "big bang" theories, all start with vacuum fluctuations that produce equal amounts of matter and antimatter. Violation of CP symmetry is a necessary element of any explanation of how the antimatter disappeared.

CP violation in weak decays was first demonstrated in 1964 in the decays of the neutral K_L meson. While the "Standard Model" of elementary particle physics has within it a mechanism for generating CP violation, it is by no means clear that the Standard Model mechanism accounts for all of the observed effect. Furthermore, the Standard Model has many fundamental parameters with no explanation of the relationships between them, which strongly suggests that it is incomplete and that there is new physics waiting to be discovered. Making a broad range of very precise measurements of CP violation in b decays offers many constraints on the Standard Model and may provide the crucial leads on how to extend it. CP violation is expected to be very small in charm decays. Finding CP violation or mixing at larger than expected levels would almost certainly be driven by new physics. If the Standard Model does prove to explain this and other phenomena in weak decays, precise measurements of the parameters could point us to understanding the relations among the fundamental parameters and may still point us to an understanding beyond the model.

The total b cross section at the Tevatron is ~100 μb. With a machine luminosity of $2\times10^{32}cm^{-2}s^{-1}$, we expect ~$4\times10^{11}$ b's in a "Snowmass" year of running (10^7s). This is a large sample of b's that allows precision measurements of B_s mixing, the CP violating angles α, β and γ, rare decay branching ratios, and CP violation in rare decays. Charm production is ~10 higher than b production and we can search for CP violation and mixing in this sector as well.

BTeV has chosen the "forward" detector geometry shown in the accompanying figure. There are several important advantages in this scheme that must be exploited to overcome the 500 times larger background rate for ordinary collisions than b collisions. In order to extract the b signal we need an efficient trigger that rejects most of the background. To help triggering it is important to get the b's to move at large momentum to defeat multiple scattering. The forward direction naturally selects fast b's. For the first level trigger, we use the presence of evidence for secondary vertices, which provides high efficiency for a broad range of b-decays while achieving excellent rejection of light quark events. To provide the best possible input to triggering and to achieve excellent proper time resolution required to follow the very rapid oscillations of the B_s meson, we use a vertex detector based on silicon pixels. Another crucially important advantage of the forward direction is that it allows space for charged hadron identification using a Ring Imaging Cherenkov detector (RICH). The RICH allows us to virtually eliminate the background in many important decay modes. For example, we reject the larger $B^0 \to K^-\pi^+$ background from $B^0 \to \pi^+\pi^-$. Finally, instrumenting the forward region inherently costs less than a cylindrical detector for the central region, thus allowing us to be able to afford a state-of-the-art electromagnetic calorimeter based on lead-tungstate crystals which will permit reconstruction of π^0's and single photons even in the difficult environment of the Tevatron.

Current activities include completion of detector R&D and final baseline design, continuation of our detailed program of detector and physics simulations, and preparations for a full cost review in early 2002. We expect to be taking data in 2006. The BTeV proposal can be viewed at http://www-btev.fnal.gov/public_documents/btev_proposal/index.html.

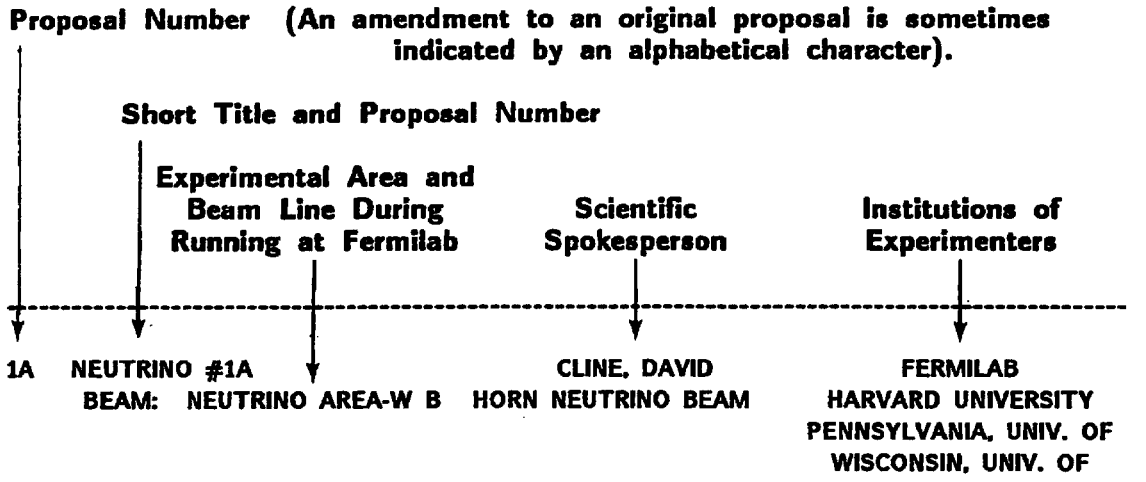
SECTION VIII. MASTER LIST OF PROPOSALS

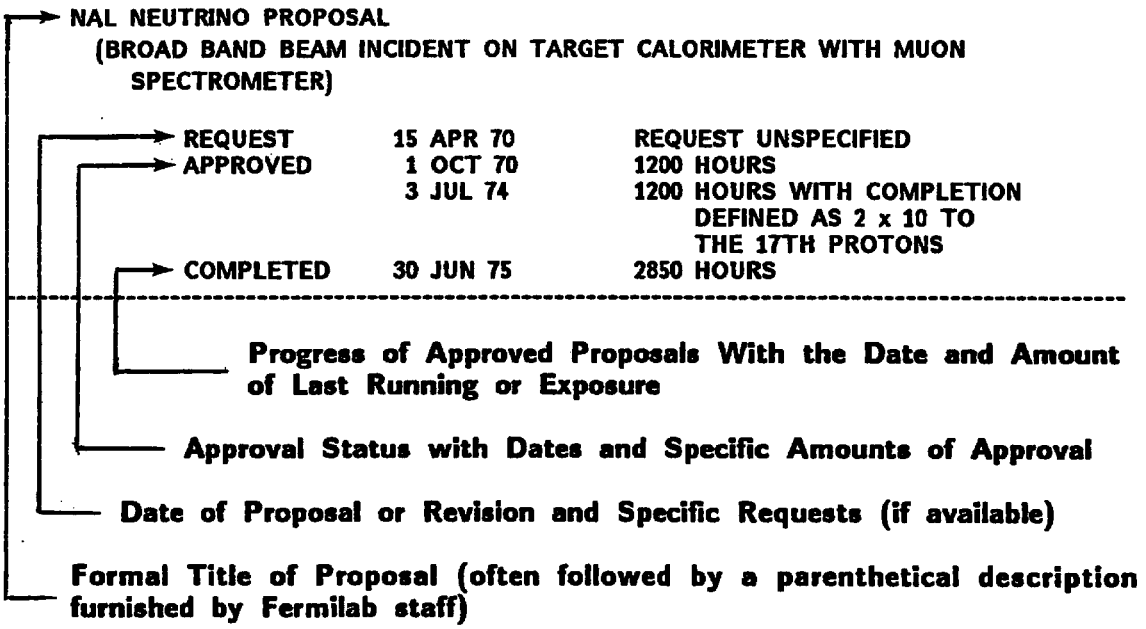
The Master List of proposals contains an entry for each proposal submitted to Fermilab; a typical entry is explained on the next page. In addition to the formal title of the proposal and a brief parenthetical explanation, the name of the spokesperson and a list of participating institutions are included. In the lower part of each entry the specific requests for running time to complete the experiment are listed together with approval action by the Laboratory. For approved proposals only, the amount of running time granted is given together with the current status and extent of beam time used so far.

Most of the information about each proposal stored in the Program Planning Office data file is given in the Master List; lists of proposals shown elsewhere in this Workbook are based on the information contained in the Master List.

For proposals with number below 700, only those which are approved or unconsidered or deferred are listed in the following pages; those with obsolete status (rejected or withdrawn/inactive) are omitted, which explains the gaps in the sequential listing. The complete listing is given starting with proposal 700.

EXPLANATION OF A TYPICAL ENTRY IN THE MASTER LIST





Note: For proposals having a number below 700 only the approved and pending ones are listed.
Total number of proposals - 919 ... Total number of approved & pending proposals - 451

1A NEUTRINO #1A — David B. Cline — FERMILAB; HARVARD UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - Wide Band Horn
NAL NEUTRINO PROPOSAL.
(Broad band beam incident on target calorimeter with muon spectrometer.)

Request	15 Apr, 70	Unspecified	
Approval	1 Oct, 70	1,200 Hours	
	3 Jul, 74	1,200 Hours	with completion of the experiment defined as 20,000 events with 2 x 10 to the 17th protons on a horn-focused beam
Completed	30 Jun, 75	2,850 Hours	

2B 30-INCH HYBRID #2B — Gerald A. Smith — DUKE UNIVERSITY; FERMILAB; IOWA STATE UNIVERSITY; UNIVERSITY OF MARYLAND; MICHIGAN STATE UNIVERSITY; NOTRE DAME UNIVERSITY; PURDUE UNIVERSITY; UNIVERSITY OF TORONTO (CANADA); UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - 30 in. Hadron Beam
STUDY OF MULTIPARTICLE P-P AND PI-P INTERACTIONS FROM 100 GEV/C TO 400 GEV/C WITH A 30-INCH BUBBLE CHAMBER-OPTICAL SPARK CHAMBER HYBRID SYSTEM.

Request	11 May, 70	Unspecified but to include an exposure for study of p - p and pi- - p interactions from 75 to 300 GeV		
	29 Apr, 71	500 K Pix		
Approval	1 May, 71	450 K Pix	100K pix of p - p @ 200 GeV 100K pix of p - p @ 300 GeV) 120K pix of pi minus - p @ 200 GeV 50K pix of pi minus - p @ 100 GeV) 80K pix of pi plus - p @ 100 GeV	ANL/Fermilab, MSU, ISU, MD Duke, Toronto, Notre Dame Purdue, Wisconsin
Completed	22 Apr, 74	479 K Pix	114K pix of p - p @ 200 105K pix of p - p @ 300 123K pix of pi- - p @ 200 54K pix of pi- - p @ 100 83K pix of pi+ - p @ 100 bonus pix: 350K pix from #37A, #121A, #125, #137, #138, #141A, #143, #252	

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3 MONOPOLE #3 — Philippe Eberhard — LAWRENCE BERKELEY LABORATORY

BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR A SEARCH FOR MAGNETIC MONOPOLES AT NAL.
(Ferromagnetic target located in a beam dump.)

Request	20 May, 70	Target Exposure(s) to 1 x 10 to 18th protons	
Approval	1 Aug, 70	Target Exposure(s)	
Completed	4 Sep, 74	4 Targets Exposed	

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4 NEUTRON CROSS SECTION #4 — Michael J. Longo — LAWRENCE BERKELEY LABORATORY; UNIVERSITY OF MICHIGAN - ANN ARBOR

BEAM: Meson Area - M3 Beam
NEUTRON TOTAL CROSS SECTIONS UP TO 300 GEV.
(Total cross sections on H2, D2, heavy nuclei to < 2%.)

Request	20 May, 70	300 Hours	with 100 hours for tune up and 200 hours for data to measure total cross sections
Approval	1 Aug, 70	400 Hours	
Completed	20 Mar, 74	1,450 Hours	

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7 ELASTIC SCATTERING #7 — Donald I. Meyer — ARGONNE NATIONAL LABORATORY; FERMILAB; INDIANA UNIVERSITY; UNIVERSITY OF MICHIGAN - ANN ARBOR

BEAM: Meson Area - M1 Beam
PROPOSAL TO MEASURE PI+(-) - P AND P-P DIFFERENTIAL ELASTIC SCATTERING CROSS SECTIONS FROM 50 TO 170 GEV/C.
(In addition, data will be taken on K+(-) - p and pbar - p simultaneously; t from 0.1 - 2.0 or 3.0.)

Request	10 Jun, 70	1,600 Hours	
Approval	1 Aug, 70	800 Hours	
Completed	28 Jan, 75	2,350 Hours	

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8 NEUTRAL HYPERON #8 — Lee G. Pondrom — UNIVERSITY OF MICHIGAN - ANN ARBOR; RUTGERS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M2 Beam
EXPERIMENTS IN A NEUTRAL HYPERON BEAM.
(Beam survey, delta s = 2 decay search, and lambda - p scattering.)

Request	12 Jun, 70	260 Hours	for data
Approval	1 Aug, 70	400 Hours	
Completed	22 Mar, 76	2,450 Hours	

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12 NEUTRON BACKWARD SCATTERING #12 — Neville W. Reay — CARELTON UNIVERSITY (CANADA); MICHIGAN STATE UNIVERSITY; OHIO STATE UNIVERSITY

BEAM: Meson Area - M3 Beam
A STUDY OF NEUTRON-PROTON CHARGE-EXCHANGE SCATTERING IN THE MOMENTUM RANGE 50-300 GEV/C.
(u from 0.002 - 1.0.)

Request	15 Jun, 70	760 Hours	
Approval	1 Aug, 70	600 Hours	with priority lower than exp #4
Completed	2 Dec, 74	1,300 Hours	

14A PROTON-PROTON INELASTIC #14A — Paolo Franzini — COLUMBIA UNIVERSITY; SUNY AT STONY BROOK

BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY INELASTIC HIGH-ENERGY PROTON-PROTON COLLISIONS IN THE DIFFRACTIVE REGION.
(t from 0.001 - 0.07 and missing mass to 10 GeV.)

Request	15 Jun, 70	200 Hours	
Approval	1 Mar, 71	150 Hours	with low priority
Completed	21 Jun, 73	140 Hours	

21A NEUTRINO #21A — Barry C. Barish — CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB

BEAM: Neutrino Area - Dichromatic
NEUTRINO PHYSICS AT VERY HIGH ENERGIES.
(Dichromatic beam incident on target calorimeter with muon spectrometer.)

Request	15 Jun, 70	750 Hours	
Approval	1 Aug, 70	1,200 Hours	
	26 Jun, 74	1,200 Hours	with the inclination for the completion of exp# 21A (approximately 400 hours) to have a lower priority than running for exp# 320
	11 Nov, 74	1,200 Hours	with remaining running to be coordinated with exp# 254
Completed	2 Nov, 75	2,450 Hours	

22 MULTIGAMMA #22 — George B. Collins — BROOKHAVEN NATIONAL LABORATORY; VIRGINIA TECH
BEAM: Meson Area - M2 Beam
EXPERIMENTAL PROPOSAL TO THE NATIONAL ACCELERATOR LABORATORY FOR A SEARCH FOR MULTIGAMMA EVENTS FROM MAGNETIC MONOPOLE PAIRS.

Request	15 Jun, 70	100 Hours for data
Approval	1 Aug, 70	200 Hours for hadron beam use only
Completed	26 Jun, 74	350 Hours

25A PHOTON TOTAL CROSS SECTION #25A — David O. Caldwell — UNIV. OF CALIFORNIA, SANTA BARBARA; FERMILAB; LEBEDEV PHYSICAL INST. (RUSSIA); UNIVERSITY OF TORONTO (CANADA)
BEAM: Proton Area - East
MEASUREMENT OF THE TOTAL PHOTOABSORPTION CROSS SECTION ON H, D, C, CU, AND PB FOR PHOTON ENERGIES FROM 14 TO 300 GEV, AND A SEARCH FOR THE PHOTOPRODUCED MONOPOLE.

Request	15 Jun, 70	400 Hours for data
Approval	1 Aug, 71	600 Hours with 200 hours for tuning, 400 hours for data
	26 Oct, 76	1,000 Hours with additional 400 hours for the experiment to continue data taking until 30 Nov 1976
Completed	30 Nov, 76	1,850 Hours

26 MUON #26 — Louis N. Hand — UNIV. OF CALIFORNIA, SAN DIEGO; CORNELL UNIVERSITY; LAWRENCE BERKELEY LABORATORY; MICHIGAN STATE UNIVERSITY
BEAM: Neutrino Area - Muon/Hadron Beam
HIGH MOMENTUM TRANSFER INELASTIC MUON SCATTERING AND TEST OF SCALE INVARIANCE AT NAL.

Request	15 Jun, 70	Unspecified
Approval	1 Aug, 70	500 Hours
	6 Aug, 73	500 Hours defined as 3 x 10 to the 17th protons
Completed	16 Apr, 74	900 Hours

27A NEUTRON DISSOCIATION #27A — Jerome L. Rosen — FERMILAB; UNIVERSITY OF MASSACHUSETTS; NORTHWESTERN UNIVERSITY; UNIVERSITY OF ROCHESTER
BEAM: Meson Area - M3 Beam
PROPOSAL TO STUDY THE COHERENT DISSOCIATION OF NEUTRONS.

Request	15 Jun, 70	Unspecified
Approval	1 Mar, 71	200 Hours for low priority Stage I running
Completed	24 Apr, 74	850 Hours

28A 15-FOOT NEUTRINO/H2&NE #28A — William F. Fry — CERN (SWITZERLAND); UNIVERSITY OF HAWAII AT MANOA; LAWRENCE BERKELEY LABORATORY; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Neutrino Area - Wide Band Horn
SEARCH FOR HEAVY LEPTONS AND HARD PENETRATING RADIATION IN THE NEUTRINO BEAM; STUDY DIFFRACTION SCATTERING OF NEUTRINOS AND DEEP INELASTIC MUON-NEUTRINO SCATTERING IN A NEON BUBBLE CHAMBER AT NAL; TEST OF DELTA S=DELTA Q RULE @ HIGH MOMENTUM

Request	15 Jun, 70	1,000 K Pix to include 500K pix with the primary protons incident on the hadron shield and 500K pix with normal targetry
Approval	1 Dec, 71	100 K Pix with 50K pix of neutrinos in neon (greater than or equal to 30%) with the constraint that running conditions yield at least 10,000 events; and 50K pix of neutrinos using special targeting
	9 May, 75	100 K Pix total of neutrinos in the 22% neon mixture under horn focusing conditions
Completed	11 Jun, 75	97 K Pix

31A 15-FOOT ANTI-NEUTRINO/H2 #31A — Malcolm Derrick — ARGONNE NATIONAL LABORATORY; CARNEGIE-MELLON UNIVERSITY; PURDUE UNIVERSITY
BEAM: Neutrino Area - Wide Band Horn
PROPOSAL TO INVESTIGATE MUON-ANTINEUTRINO INTERACTIONS IN HYDROGEN AT NAL.

Request	15 Jun, 70	1,000 K Pix requiring a total exposure of 10 to the 19th protons with 10 to the 13th protons per pulse on target
Approval	1 Dec, 71	200 K Pix maximum with the constraint that the running conditions yield at least 7,000 antineutrino interactions
Completed	13 Aug, 77	211 K Pix

34 DETECTOR DEVELOPMENT #34 — Richard W. Huggett — LOUISIANA STATE UNIVERSITY; MAX-PLANCK INSTITUTE (GERMANY)
BEAM: Neutrino Area - Miscellaneous
NUCLEAR-ELECTROMAGNETIC CASCADE DEVELOPMENT STUDY.
(Ionization spectrometer development.)

Request	15 Jun, 70	400 Hours in two calibration runs
Approval	1 Aug, 70	Parasitic Running
Completed	26 Jun, 74	50 Hours

36A PROTON-PROTON SCATTERING #36A — Rodney L. Cool — FERMILAB; JINR, DUBNA (RUSSIA); UNIVERSITY OF ROCHESTER; ROCKEFELLER UNIVERSITY
BEAM: Internal Target Area (C-0)
A PROPOSAL TO STUDY SMALL ANGLE P-P SCATTERING AT VERY HIGH ENERGIES.
(Using a gas jet target and the internal proton beam.)

Request	15 Jun, 70	550 Hours
Approval	1 Feb, 71	500 Hours
Completed	24 Jun, 73	700 Hours

37A 30-INCH P-P @ 300 #37A — Ernest I. Malamud — CALIFORNIA INSTITUTE OF TECHNOLOGY; UNIV. OF CALIFORNIA, LOS ANGELES; FERMILAB; INDIANA UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
MULTIBODY FINAL STATES IN PP COLLISIONS UP TO 500 GEV.

Request	15 Jun, 70	250 K Pix of p - p interactions at 100,200,300,400,500 GeV in 15-foot chamber
	3 May, 71	100 K Pix of p - p interactions at one fixed high energy in 30-inch chamber
Approval	26 Aug, 71	50 K Pix in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	1 Jun, 73	51 K Pix

45A 15-FOOT NEUTRINO/H2 #45A — Frank A. Nezrick — FERMILAB; UNIVERSITY OF HAWAII AT MANOA; LAWRENCE BERKELEY LABORATORY; UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Neutrino Area - Wide Band Horn
PROPOSAL TO STUDY NEUTRINO INTERACTIONS WITH PROTONS USING THE 15-FOOT BUBBLE CHAMBER AT NAL.

Request	15 Jun, 70	200 K Pix with 10 to the 13th protons/pulse of at least 200 GeV
	19 Jul, 71	500 K Pix with 10 to the 13th protons/pulse at 350 GeV
Approval	17 Dec, 71	300 K Pix maximum with the constraint that the running conditions yield on the order of 15,000 events of neutrinos in hydrogen
Completed	13 Jan, 76	162 K Pix

48 MUON SEARCH #48 — Robert K. Adair — BROOKHAVEN NATIONAL LABORATORY; FERMILAB; YALE UNIVERSITY
BEAM: Proton Area - Center
A MEASUREMENT OF THE INTENSITY AND POLARIZATION OF MUONS PRODUCED DIRECTLY BY THE INTERACTIONS OF PROTONS WITH NUCLEI.

Request	15 Jun, 70	200 Hours
Approval	1 Dec, 70	200 Hours for an exploratory experiment
Completed	1 Dec, 75	500 Hours

51A MISSING MASS #51A — Eberhard Von Goeler — NORTHEASTERN UNIVERSITY
BEAM: Meson Area - M2 Beam
MASS SPECTRA AND DECAY MODES FOR HADRONS WITH MASSES UP TO 15 GEV.

Request	15 Jun, 70	850 Hours	
Approval	14 Aug, 73	300 Hours	with low priority
Completed	23 Oct, 74	800 Hours	

53A 15-FOOT NEUTRINO/H2&NE #53A — Charles Baltay — BROOKHAVEN NATIONAL LABORATORY; COLUMBIA UNIVERSITY
BEAM: Neutrino Area - Wide Band Horn
SEARCH FOR THE INTERMEDIATE BOSON, LEPTON PAIR PRODUCTION, AND A STUDY OF DEEPLY INELASTIC REACTIONS UTILIZING HIGH ENERGY NEUTRINO INTERACTIONS IN LIQUID NEON.

Request	15 Jun, 70	1,000 K Pix	of neutrino interactions in 15-foot with 70% neon and 30% deuterium and with inserted plate
	6 Jul, 71	1,000 K Pix	with 900K pix of neutrino interactions in neon with single plate and 100K pix in hydrogen with two plates
	16 Jun, 76	200 K Pix	requested increase of the approved picture total from 100K to 200K
	25 Jan, 78	450 K Pix	to include an increase of 300K beyond the approximately 150K pix presently available for the experiment; at least 150K pix additional are requested during the summer or fall of 1978
	19 Jun, 78	450 K Pix	to include an increase of 300K pix; this follows rejection of the
Approval	17 Dec, 71	100 K Pix	in neon or plates to yield at least 20,000 events total including
	29 Jun, 76	150 K Pix	total including about 50K pix already taken
	28 Jun, 78	450 K Pix	total including an extension for 300K pix
Completed	9 Mar, 81	440 K Pix	

61 POLARIZED SCATTERING #61 — Owen Chamberlain — ARGONNE NATIONAL LABORATORY; FERMILAB; HARVARD UNIVERSITY; LAWRENCE BERKELEY LABORATORY; SUFFOLK UNIVERSITY; YALE UNIVERSITY
BEAM: Meson Area - M1 Beam
A PROPOSAL TO MEASURE POLARIZATION IN P P, PI- P, AND PI+ P ELASTIC SCATTERING AT 50, 100, AND 150 GEV/C.

Request	15 Jun, 70	1,100 Hours	for setup, tests, and data
	10 Mar, 77	1,600 Hours	to include additional time for 4 weeks of data at 300 GeV and 1 week at 100 GeV; running requires accelerator operation at those energies
Approval	1 Aug, 70	800 Hours	
	24 Jun, 77	1,200 Hours	with an attempt to provide 300 GeV data under the condition that the running not interfere with other major laboratory programs
Completed	26 Oct, 77	1,900 Hours	

63A PHOTON SEARCH #63A — James K. Walker — FERMILAB; UNIVERSITY OF HAWAII AT MANOA; NORTHERN ILLINOIS UNIVERSITY
BEAM: Internal Target Area (C-0)
SURVEY OF PARTICLE PRODUCTION IN PROTON COLLISIONS AT NAL.
(Photon production in proton collisions at the Internal Target Area; see also exp #284.)

Request	15 Jun, 70	Unspecified	
Approval	17 Dec, 70	400 Hours	
	19 Oct, 73	400 Hours	with understanding that additional photon production data would be taken at 60, 50, 40, 30, and 20 mrads
Completed	13 Mar, 75	2,600 Hours	

67A PROTON-PROTON MISSING MASS #67A — Felix Sannes — FLORIDA STATE UNIVERSITY; RUTGERS UNIVERSITY; UPSALA COLLEGE
BEAM: Internal Target Area (C-0)
SEARCH FOR BARYON RESONANCES UP TO 10 GEV MASS PRODUCED IN P + P TO P + MM WITH A RESOLUTION OF + OR - 25 MEV.
(Using a gas jet target and the internal proton beam.)

Request	15 Jun, 70	Unspecified	
Approval	1 Feb, 71	100 Hours	
Completed	8 Aug, 73	600 Hours	

69A ELASTIC SCATTERING #69A — Joseph Lach — FERMILAB; RUTHERFORD-APPLETON LABS.(ENGLAND); YALE UNIVERSITY
BEAM: Meson Area - M6 Beam
ELASTIC SCATTERING OF THE LONG-LIVED HADRONS.
(Small angle scattering to t of 0.2 and coulomb interference.)

Request	15 Jun, 70	380 Hours	of 'ideal time' to make coulomb interference measurements with stable particles and diffraction peak measurements with hyperons
	1 Dec, 70	180 Hours	of 'ideal time' to make coulomb interference measurements with stable particles; also see exp# 97 and 497
Approval	15 Sep, 70	600 Hours	
Completed	3 Mar, 76	2,800 Hours	

70 LEPTON #70 — Leon M. Lederman — COLUMBIA UNIVERSITY; FERMILAB
BEAM: Proton Area - Center
STUDY OF LEPTON PAIRS FROM PROTON-NUCLEAR INTERACTIONS; SEARCH FOR INTERMEDIATE BOSONS AND LEE-WICK STRUCTURE.

Request	23 Jun, 70	2,800 Hours	to include about 1,700 hours for study of single lepton production and 1,100 hours for study of lepton pairs
Approval	1 Dec, 70	600 Hours	
Completed	1 Dec, 74	2,800 Hours	

72 QUARK #72 — Lawrence B. Leipuner — BROOKHAVEN NATIONAL LABORATORY; YALE UNIVERSITY
BEAM: Meson Area - M4 Beam
EXPERIMENTAL PROPOSAL TO NAL -- QUARK SEARCH.
(By measuring ionization energy loss.)

Request	15 Jun, 70	100 Hours	for data taking
Approval	1 Aug, 70	200 Hours	
Completed	11 Jun, 73	500 Hours	

75 QUARK #75 — Taiji Yamanouchi — FERMILAB; NEW YORK UNIVERSITY
BEAM: Meson Area - M2 Beam
A PROPOSAL TO SEARCH FOR FRACTIONALLY CHARGED QUARKS.
(Measurement of ionization and total energy of fractionally charged particles using momentum selection.)

Request	29 Jun, 70	200 Hours	for tests and data taking
Approval	1 Sep, 70	200 Hours	
Completed	8 Sep, 73	1,050 Hours	

76 MONOPOLE #76 — Richard A. Carrigan — FERMILAB
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR MAGNETIC MONOPOLES PRODUCED AT NAL.
(Employing a beam-dump target.)

Request	15 Jun, 70	Parasitic Running	
Approval	1 Sep, 70	Target Exposure(s) with parasitic running	
Completed	1 Dec, 74	5 Targets Exposed	

81A NUCLEAR CHEMISTRY #81A — Sheldon Kaufman
BEAM: Meson Area - Miscellaneous
PRELIMINARY SURVEY OF 200 GEV PROTON INTERACTIONS WITH COMPLEX NUCLEI.
(Nuclear chemistry analysis.)

ARGONNE NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
CARNEGIE-MELLON UNIVERSITY
UNIVERSITY OF CHICAGO
UNIV. OF ILLINOIS, CHICAGO CIRCLE
PURDUE UNIVERSITY
RBL, ORSAY (FRANCE)

Request	9 Jul, 70	Parasitic Running
Approval	1 Aug, 70	Target Exposure(s)
Completed	1 Oct, 78	197 Bombardment(s)

82 K ZERO REGENERATION #82 — Valentine L. Telegdi
BEAM: Meson Area - M4 Beam
PROPOSAL TO INVESTIGATE REGENERATION OF NEUTRAL K-MESONS AT VERY HIGH ENERGIES.
(See exp #425.)

UNIV. OF CALIFORNIA, SAN DIEGO
UNIVERSITY OF CHICAGO
SLAC
UNIVERSITY OF WISCONSIN - MADISON

Request	13 Jul, 70	1,000 Hours for preliminary run and data taking
Approval	15 Sep, 70	800 Hours
	22 Nov, 74	1,100 Hours total including additional 300 hours with complex nuclear targets
Completed	5 Jul, 75	3,500 Hours

86A PION DISSOCIATION #86A — Henry J. Lubatti
BEAM: Meson Area - M1 Beam
A PROPOSAL TO STUDY INELASTIC DIFFRACTIVE PROCESSES BY OBSERVING COHERENT PRODUCTION OF MULTI-PION FINAL STATES FROM HE NUCLEI.
(Using a streamer chamber.)

LAL, ORSAY (FRANCE)
UNIVERSITY OF WASHINGTON

Request	24 Jul, 70	1,050 Hours for setup, tests and data taking
Approval	28 May, 71	800 Hours with low priority
Completed	22 Mar, 76	800 Hours

87A PHOTOPRODUCTION #87A — Thomas A. O'Halloran, Jr.
BEAM: Proton Area - East
PROPOSAL TO SEARCH FOR HEAVY LEPTONS AND INTERMEDIATE BOSONS FROM PHOTON-NUCLEON AND PHOTON-NUCLEI COLLISIONS.

COLUMBIA UNIVERSITY
FERMILAB
UNIVERSITY OF HAWAII AT MANOA
UNIVERSITY OF ILLINOIS, CHAMPAIGN

Request	30 Jul, 70	Unspecified
	25 Feb, 71	4,400 Hours for setup, tests, and data taking
Approval	1 Aug, 71	600 Hours
	13 Nov, 75	1,100 Hours with an extension of 500 hours of data taking
	28 Jul, 77	3,100 Hours with an additional 2,000 hours for study of charmed baryon production
Completed	7 May, 78	4,800 Hours

90 EMULSION/PROTONS @ 200 #90 — Wladyslaw Wolter
BEAM: Meson Area - Miscellaneous
CRACOW NUCLEAR EMULSION EXPOSURES.

INP, KRAKOW (POLAND)

Request	23 Jun, 70	Emulsion Exposure
Approval	1 Aug, 70	Emulsion Exposure
Completed	20 Sep, 72	4 Stack(s)

95A PHOTON SEARCH #95A — Bradley B. Cox
BEAM: Proton Area - West
PROPOSAL FOR EXAMINATION OF WIDE ANGLE GAMMA RAYS AT NAL.
(Single and digamma production by proton-nucleon collisions.)

FERMILAB
JOHNS HOPKINS UNIVERSITY

Request	26 Oct, 70	100 Hours of data taking with parasitic beam used for setup
	12 Oct, 76	3,100 Hours for further study of diphoton spectra
Approval	1 Jun, 71	400 Hours
	5 Jan, 77	1,650 Hours with an extension in an effort to approach the 12.5 weeks of running which was requested
	12 Sep, 77	1,950 Hours with approval of an additional 3 weeks of running at 200/300 GeV
Completed	17 Oct, 77	3,400 Hours

96 ELASTIC SCATTERING #96 — David Ritson
BEAM: Meson Area - M6 Beam
FOCUSING SPECTROMETER FACILITY.
(Measure elastic scattering and quasi elastic scattering of pi+(-), K+(-), p+(-) on H2 and D2 up to 200 GeV/c with t up to 1.5.)

ARGONNE NATIONAL LABORATORY
UNIVERSITY OF BARI (ITALY)
BROWN UNIVERSITY
CERN (SWITZERLAND)
CORNELL UNIVERSITY
FERMILAB
MASSACHUSETTS INST. OF TECHNOLOGY
NORTHEASTERN UNIVERSITY
STANFORD UNIVERSITY

Request	3 Dec, 70	1,000 Hours for check out and data taking
Approval	1 Dec, 70	800 Hours
Completed	17 Feb, 75	2,550 Hours

98 MUON #98 — Herbert L. Anderson
BEAM: Neutrino Area - Muon/Hadron Beam
MUON-PROTON INELASTIC SCATTERING EXPERIMENT AT THE NATIONAL ACCELERATOR LABORATORY.
(Using a large aperture magnet to detect scattered muons and charged hadrons.)

UNIVERSITY OF CHICAGO
HARVARD UNIVERSITY
UNIVERSITY OF ILLINOIS, CHAMPAIGN
UNIVERSITY OF OXFORD (ENGLAND)

Request	2 Dec, 70	1,600 Hours for tests and data taking
Approval	19 Jan, 71	400 Hours of initial running with H2 (100 hours of parasitic testing)
	6 Aug, 73	400 Hours with approval for both D2 and H2
	26 Jun, 74	800 Hours with additional 400 hours for data taking
Completed	17 Feb, 75	1,800 Hours

99 ASSOCIATED PRODUCTION #99 — Robert E. Diebold
BEAM: Meson Area - M6 Beam
A STUDY OF PI+ P TO K+ SIGMA+ AND PI+ P TO K+ Y-STAR+ USING THE FOCUSING SPECTROMETER FACILITY.
(Incident momenta from 20 - 120 GeV/c, t from 0.04 - 0.6.)

ARGONNE NATIONAL LABORATORY
FERMILAB
SLAC
STANFORD UNIVERSITY

Request	3 Dec, 70	500 Hours for tests and data taking
Approval	25 Nov, 74	500 Hours
Completed	24 Jan, 78	750 Hours

100A PARTICLE SEARCH #100A — Pierre A. Piroue
BEAM: Proton Area - East
A PROPOSAL TO STUDY PARTICLE PRODUCTION AT HIGH TRANSVERSE MOMENTA.
(Measurement of particle production at 90 degrees in c.m. from proton interactions with nuclei.)

UNIVERSITY OF CHICAGO
PRINCETON UNIVERSITY

Request	4 Dec, 70	500 Hours for data taking
Approval	1 Feb, 71	500 Hours
Completed	4 Apr, 74	1,150 Hours

103 EMULSION/PROTONS @ 200 #103 — David T. King — UNIVERSITY OF TENNESSEE, KNOXVILLE
BEAM: Meson Area - Miscellaneous
INTRA-NUCLEAR CASCADE PRODUCED BY 200 GEV PROTONS.

Request	21 Dec, 70	Emulsion Exposure
Approval	1 Feb, 71	Emulsion Exposure
Completed	20 Sep, 72	1 Stack(s)

104 TOTAL CROSS SECTION #104 — Thaddeus F. Kycia — BROOKHAVEN NATIONAL LABORATORY
BEAM: Meson Area - M1 Beam — FERMILAB
MEASUREMENT OF TOTAL CROSS SECTIONS ON HYDROGEN AND DEUTERIUM. — MAX-PLANCK INSTITUTE (GERMANY)
(Of pi+-, K+-, p, pbar.) — ROCKEFELLER UNIVERSITY
UNIVERSITY OF WASHINGTON

Request	8 Jan, 71	700 Hours	for tests and data taking
	16 Jun, 76	1,300 Hours	total with additional 600 hours for completion of cross section data and particle search exp# 354
Approval	8 Mar, 71	700 Hours	
	29 Jun, 76	1,300 Hours	including an additional 600 hours for the remainder of exp# 104 and exp# 354
Completed	22 Dec, 77	2,650 Hours	

105 EMULSION/PROTONS @ 200 #105 — Prince K. Malhotra — JAMMU UNIVERSITY (INDIA)
BEAM: Meson Area - Miscellaneous — PANJAB UNIVERSITY (INDIA)
A PROPOSAL TO STUDY SOME CHARACTERISTICS OF PROTON-NUCLEON AND PROTON-NUCLEUS COLLISIONS AT 400 GEV USING NUCLEAR EMULSIONS. — TATA INSTITUTE (INDIA)

Request	14 Jan, 71	Emulsion Exposure
Approval	1 Apr, 71	Emulsion Exposure
Completed	20 Sep, 72	1 Stack(s)

108 BEAM DUMP #108 — Miguel Awschalom — FERMILAB
BEAM: Meson Area - M2 Beam
A BEAM DUMP EXPERIMENT.
(Study of shielding including hadron cascade development, muon attenuation, radioactivity.)

Request	4 Feb, 71	40 Hours for irradiation
Approval	1 Mar, 71	40 Hours
Completed	2 Jun, 75	350 Hours

110A MULTIPARTICLE #110A — Alexander R. Dzierba — CALIFORNIA INSTITUTE OF TECHNOLOGY
BEAM: Meson Area - M6 Beam — UNIV. OF CALIFORNIA, LOS ANGELES
PROPOSAL TO STUDY MULTIPARTICLE PERIPHERAL PHYSICS AT NAL. — FERMILAB
(Using a large wire chamber magnetic spectrometer.) — UNIV. OF ILLINOIS, CHICAGO CIRCLE
INDIANA UNIVERSITY
MAX-PLANCK INSTITUTE (GERMANY)

Request	15 Feb, 71	400 Hours	for test run and overview
	10 Aug, 72	900 Hours	for tests and data taking
	21 Oct, 76	900 Hours	for data taking
Approval	5 Apr, 72	800 Hours	
	16 Nov, 73	600 Hours	with understanding that approximately 200 hours of previously approved 800 hours of running will be used for exp# 260
	18 Nov, 76	1,000 Hours	with expectation that 800 hours will be used for data taking and 2 weeks for tuneup of beam and equipment
Completed	9 Apr, 78	1,600 Hours	

111 PION CHARGE EXCHANGE #111 — Alvin V. Tollestrup — CALIFORNIA INSTITUTE OF TECHNOLOGY
BEAM: Meson Area - M2 Beam — LAWRENCE BERKELEY LABORATORY
PROPOSAL TO STUDY PI- P TO PI0 N AND PI- P TO ETA N AT HIGH ENERGY.

Request	15 Feb, 71	450 Hours for tests and data taking
Approval	1 Feb, 71	400 Hours
Completed	19 Sep, 74	1,800 Hours

114 EMULSION/PROTONS @ 200 #114 — Piyare L. Jain — SUNY AT BUFFALO
BEAM: Meson Area - Miscellaneous
STUDY OF 200-500 GEV PROTON AND PION INTERACTION WITH NUCLEAR EMULSION.

Request	24 Feb, 71	Emulsion Exposure
Approval	1 Mar, 72	Emulsion Exposure
Completed	20 Sep, 72	1 Stack(s)

115 LONG-LIVED PARTICLES #115 — M. Lynn Stevenson — LAWRENCE BERKELEY LABORATORY
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR LONG-LIVED PARTICLES
(Tau greater than or approximately equal 0.1 msec; analysis of particles from a beam dump.)

Request	1 Mar, 71	Parasitic Running
Approval	26 Aug, 71	Parasitic Running
Completed	23 Nov, 74	6 Hours

116 EMULSION/PROTONS @ 200 #116 — Jacques D. Hebert — UNIVERSITY OF BARCELONA (SPAIN)
BEAM: Meson Area - Miscellaneous — CRN, STRASBOURG (FRANCE)
INTERACTION OF HIGH ENERGY PROTONS IN NUCLEAR EMULSIONS LOADED WITH B 10 AND LIF. — FERMILAB
UNIVERSITY OF LYON (FRANCE)
MCGILL UNIVERSITY (CANADA)
UNIVERSITY OF MONTREAL (CANADA)
UNIVERSITY OF OTTAWA (CANADA)
UNIVERSITY OF VALENCIA (SPAIN)

Request	31 Mar, 71	Emulsion Exposure
Approval	1 Apr, 71	Emulsion Exposure
Completed	20 Sep, 72	5 Stack(s)

117A EMULSION/PROTONS @ 200 #117A — Osamu Kusumoto — KINKI UNIVERSITY (JAPAN)
BEAM: Meson Area - Miscellaneous — KOBE UNIVERSITY (JAPAN)
PHENOMOLOGICAL STUDY OF 200 AND 500 GEV/C PROTON-PROTON COLLISIONS IN EMULSION. — OSAKA CITY UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)
WAKAYAMA MEDICAL COLLEGE (JAPAN)

Request	2 Mar, 71	Emulsion Exposure
Approval	1 Apr, 71	Emulsion Exposure
Completed	20 Sep, 72	11 Stack(s)

118A INCLUSIVE SCATTERING #118A — George W. Brandenburg — UNIVERSITY OF BARI (ITALY); BROWN UNIVERSITY; FERMILAB; MASSACHUSETTS INST. OF TECHNOLOGY

BEAM: Meson Area - M6 Beam
HADRON SPECTRA FROM HIGH ENERGY INTERACTIONS.
(Single particle inclusive spectra from pions, kaons, and protons using single arm spectrometer.)

Request	3 Mar, 71	950 Hours	for tests and data taking
	20 Jun, 73	1,200 Hours	total with additional 250 hours of data taking
	22 Oct, 76	950 Hours	with an additional 350 hours to extend existing measurements; see proposal #513
Approval	25 Nov, 74	600 Hours	
	18 Nov, 76	950 Hours	with additional 350 hours for continued data taking
Completed	20 Jul, 77	2,550 Hours	

120 PHOTON SEARCH #120 — David B. Cline — UNIVERSITY OF CHICAGO; HARVARD UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Internal Target Area (C-0)
EARLY PI ZERO PARTICLE PRODUCTION SURVEY WITH THE GAS JET TARGET.
(Also direct photon production using the internal proton beam.)

Request	9 Mar, 71	Unspecified	
Approval	1 Jun, 71	200 Hours	
Completed	29 May, 73	1,200 Hours	

121A 30-INCH PI+ & P - P @ 100 #121A — Richard L. Lander — UNIV. OF CALIFORNIA, DAVIS; LAWRENCE BERKELEY LABORATORY

BEAM: Neutrino Area - 30 in. Hadron Beam
A PROPOSAL TO SEARCH FOR VERY HEAVY STRANGE PARTICLES USING A SMALL HYDROGEN BUBBLE CHAMBER.

Request	11 Mar, 71	100 K Pix	
	17 May, 71	200 K Pix	total with 50K at each of four incident proton momenta, 100, 200, 300, and 400 GeV/c
Approval	26 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	23 Jan, 74	104 K Pix	

125 30-INCH PI- - P @ 100 #125 — Douglas R. O. Morrison — CERN (SWITZERLAND)

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY PI- P REACTIONS AT 60 AND 200 GEV/C IN THE 30-INCH.

Request	7 May, 71	100 K Pix	
Approval	27 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	28 Aug, 73	53 K Pix	

137 30-INCH PI- - P @ 200 #137 — Fred Russell Huson — UNIV. OF CALIFORNIA, BERKELEY; FERMILAB; LAWRENCE BERKELEY LABORATORY

BEAM: Neutrino Area - 30 in. Hadron Beam
STUDY OF PI- + P INTERACTIONS AT HIGH ENERGY.

Request	4 May, 71	50 K Pix	
Approval	26 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	10 Mar, 73	48 K Pix	

138 30-INCH P-P @ 400 #138 — Jack C. Vander Velde — UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF ROCHESTER

BEAM: Neutrino Area - 30 in. Hadron Beam
STUDY OF MULTIPARTICLE PRODUCTION IN A 30-INCH BUBBLE CHAMBER.

Request	10 May, 71	240 K Pix	total; combined experiment from proposals #62 and #80
Approval	26 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	26 Aug, 75	52 K Pix	

141A 30-INCH P-P @ 200 #141A — Thomas H. Fields — ARGONNE NATIONAL LABORATORY; FERMILAB; IOWA STATE UNIVERSITY; UNIVERSITY OF MARYLAND; MICHIGAN STATE UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
STUDY OF PP INTERACTIONS IN THE ANL 30-INCH HYDROGEN BUBBLE CHAMBER AT NAL.

Request	25 Jun, 71	50 K Pix	
Approval	26 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	27 Nov, 72	67 K Pix	

142 SUPER-HEAVY ELEMENTS #142 — Raymond W. Stoughton — ARGONNE NATIONAL LABORATORY; OAK RIDGE NATIONAL LABORATORY

BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR A SEARCH FOR SUPERHEAVY ELEMENTS BY IRRADIATIONS AT NAL.

Request	12 Jul, 71	Parasitic Running	with a total of 10 to the 18th protons on target
Approval	26 Aug, 71	Target Exposure(s)	
Completed	4 Jun, 75	1 Target(s)	

143A 30-INCH PI- - P @ 300 #143A — George R. Kalbfleisch — BROOKHAVEN NATIONAL LABORATORY; CASE WESTERN RESERVE UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL FOR A RAPID SYSTEMATIC STUDY OF ALL INTERACTIONS IN A PI- - P EXPOSURE OF THE BARE 30-INCH CHAMBER AT 120 GEV/C.

Request	12 Jul, 71	50 K Pix	
Approval	26 Aug, 71	50 K Pix	in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	10 Apr, 74	51 K Pix	

147 SUPER-HEAVY ELEMENTS #147 — Monique DeBeauvais — CRN, STRASBOURG (FRANCE); UNIVERSITY OF OTTAWA (CANADA)

BEAM: Meson Area - Miscellaneous
PROPOSAL OF AN EXPERIMENT ON THE FISSION OF VERY HEAVY NUCLEI INDUCED BY 200 GEV PROTONS.

Request	9 Jul, 71	Target Exposure(s)	
Approval	6 Aug, 73	Target Exposure(s)	
Completed	11 Jun, 75	4 Exposure(s)	

152B **PHOTOPRODUCTION #152B** — Clemens A. Heusch — UNIV. OF CALIFORNIA, SANTA CRUZ

BEAM: Proton Area - East
PROPOSAL TO BUILD AN ELECTRON-PHOTON FACILITY AT NAL AND TO MEASURE PHOTON SCATTERING AT HIGH ENERGIES.
(Measurement of total cross sections, elastic and inelastic scattering meson production, and a search for new particles.)

Request	19 Jul, 71	300 Hours	with actual data taking of 160 hours
	23 Jun, 72	490 Hours	total with an additional 190 hours of data taking
Approval	4 Mar, 74	350 Hours	with understanding that there will be a collaborative effort in development and construction of equipment with exp# 263
	28 Jun, 78	1,800 Hours	approximately with the experiment to be considered complete by the time of the fall 1978 shutdown
Completed	13 Nov, 78	1,950 Hours	

154 **30-INCH HYBRID #154** — Irwin A. Pless — BROWN UNIVERSITY, FERMILAB, ILLINOIS INSTITUTE OF TECHNOLOGY, UNIVERSITY OF ILLINOIS, CHAMPAIGN, INDIANA UNIVERSITY, JOHNS HOPKINS UNIVERSITY, MASSACHUSETTS INST. OF TECHNOLOGY, OAK RIDGE NATIONAL LABORATORY, RUTGERS UNIVERSITY, STEVENS INSTITUTE OF TECHNOLOGY, UNIVERSITY OF TENNESSEE, KNOXVILLE, YALE UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
TEST OF PROPORTIONAL WIRE CHAMBERS IN HYBRID SYSTEMS.

Request	23 Jun, 71	2,000 K Pix	
Approval	27 Aug, 71	20 K Pix	with understanding that work will be done in two phases. Phase I - design, construction, installation, and initial operation of upstream tagging system Phase II - use of downstream PWC's for feasibility test run of 20K pix
	6 Aug, 73	120 K Pix	with additional 100K pix to be taken with single type incident particles at a given energy
Completed	13 Mar, 74	105 K Pix	of pi- - p @ 150 GeV

155 **15-FOOT EMI TEST #155** — Vincent Z. Peterson — UNIVERSITY OF HAWAII AT MANOA, LAWRENCE BERKELEY LABORATORY

BEAM: Neutrino Area - Wide Band Horn
PROPOSAL TO DEVELOP A PHASE I EXTERNAL MUON IDENTIFIER (EMI) FOR USE WITH THE NAL 30 CUBIC METER BUBBLE CHAMBER.

Request	15 Jul, 71	Test Running	
Approval	27 Aug, 71	Parasitic Running	with understanding that completion of Phase I will include tests in neutrino beam with 15-ft bubble chamber in operation and number of pix to be determined at a later date
	17 Dec, 71	Parasitic Running	with 100K pix to be taken from exp# 45A exposures taken when EMI was operating; film containing about 200 events to be delivered as soon as feasible to aid in preliminary tuneup and checking
	26 Jun, 74	50 K Pix	with formal approval for dedicated pictures to follow successful analysis of 200 events from exp# 45A exposures
Completed	30 Nov, 74	14 K Pix	

156 **EMULSION/PROTONS @ 200 #156** — Kiyoshi Niu — AICHI UNIV. OF EDUCATION (JAPAN), KWANSEI GAKUIN UNIVERSITY (JAPAN), NAGOYA UNIVERSITY (JAPAN), UNIVERSITY OF TOKYO (JAPAN), YOKOHAMA NATIONAL UNIV. (JAPAN)

BEAM: Meson Area - Miscellaneous
STUDY OF SECONDARY PARTICLES PRODUCED BY 200 AND 500 GEV PROTONS IN EMULSION CHAMBERS.

Request	15 Aug, 71	Emulsion Exposure
Approval	1 Sep, 71	Emulsion Exposure
Completed	20 Sep, 72	13 Stack(s)

161 **30-INCH P - P&NE @ 300 #161** — James Mapp — UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO SURVEY HIGH ENERGY PROTON COLLISIONS IN NEON AND TO SEARCH FOR ANOMALOUS PHOTON BUNDLES AT NAL.

Request	13 Oct, 71	50 K Pix
Approval	6 Aug, 73	50 K Pix
Completed	25 Jun, 74	51 K Pix

163A **30-INCH PI- - P&NE @ 200 #163A** — William D. Walker — DUKE UNIVERSITY, UNIVERSITY OF NORTH CAROLINA

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL FOR A STUDY OF THE INTERACTION OF HIGH ENERGY PI- WITH NEON.

Request	4 Dec, 71	50 K Pix
Approval	19 Jul, 72	50 K Pix
Completed	18 Jun, 74	52 K Pix

171 **EMULSION/PROTONS @ 200 #171** — Jere J. Lord — UNIVERSITY OF WASHINGTON

BEAM: Meson Area - Miscellaneous
PROPOSED EMULSION EXPERIMENT SEARCH FOR SHORT LIVED PARTICLES AT HIGH ENERGIES.

Request	10 May, 72	Emulsion Exposure
Approval	1 Aug, 72	Emulsion Exposure
Completed	20 Sep, 72	6 Stack(s)

172 **15-FOOT ANTI-NEUTRINO/H2&NE#172** — Henry J. Lubatti — UNIV. OF CALIFORNIA, BERKELEY, UNIVERSITY OF HAWAII AT MANOA, LAWRENCE BERKELEY LABORATORY, UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - Wide Band Horn
ANTINEUTRINO INTERACTIONS IN THE 15-FOOT H2-NEON BUBBLE CHAMBER.

Request	16 May, 72	50 K Pix
Approval	19 Jul, 72	50 K Pix
Completed	25 May, 76	49 K Pix

177A **PROTON-PROTON ELASTIC #177A** — Jay Orear — CORNELL UNIVERSITY, LEBEDEV PHYSICAL INST. (RUSSIA), MCGILL UNIVERSITY (CANADA), NORTHEASTERN UNIVERSITY

BEAM: Proton Area - West
EARLY MEASUREMENT OF HIGH ENERGY P P LARGE ANGLE ELASTIC SCATTERING.

Request	12 Jun, 72	100 Hours	for initial run
	27 Oct, 72	700 Hours	total with additional 600 hours for data
Approval	13 Aug, 73	100 Hours	for Phase I; counter tests to demonstrate success of proposed technique
	28 Jun, 76	700 Hours	with 600 hours additional for data
	19 Nov, 76	1,500 Hours	with additional 800 hours to collect data at 200 GeV and 400 GeV to t-values of 18 GeV squared; completion of run expected by 15 Feb 1977
	7 Mar, 77	2,200 Hours	with additional 700 hours to collect data in high t region with completion of experiment expected at end of April 1977
Completed	19 Apr, 77	2,400 Hours	

178 MULTIPLICITIES #178 — Wit Busza
CARELTON UNIVERSITY (CANADA)
FERMILAB
MASSACHUSETTS INST. OF TECHNOLOGY

BEAM: Meson Area - M6 Beam
A STUDY OF THE AVERAGE MULTIPLICITY AND MULTICIPLICITY DISTRIBUTIONS IN HADRON-NUCLEUS COLLISIONS AT HIGH ENERGIES.
(Using Cerenkov counter pulse height analysis.)

Request	16 Jun, 72	60 Hours including 20 hours for tests
Approval	6 Aug, 73	100 Hours with understanding that running will be on a parasitic basis during tuning of M6 beam line by exp# 96
	25 Oct, 74	200 Hours with an additional 100 hours of running in the M6 beam line
Completed	14 Aug, 75	800 Hours

180 15-FOOT ANTI-NEUTRINO/H2&NE#180 — Pavel F. Ermolov
FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR
ITEP, MOSCOW (RUSSIA)
IHEP, PROTVINO (SERFUKHOV)(RUSSIA)

BEAM: Neutrino Area - Wide Band Horn
A STUDY OF ANTINEUTRINO INTERACTIONS IN THE NAL 15-FOOT BUBBLE CHAMBER, FILLED WITH HYDROGEN AND NEON.

Request	23 Jun, 72	200 K Pix
Approval	11 Jul, 72	50 K Pix of antineutrinos to run before exp# 172 and to have first choice of the two H2/neon mixtures
	29 Jun, 76	200 K Pix including an additional 150K pix; with the expectation that the experiment will involve a total of 500K pix
Approved/Inactive	1 Jun, 77	273 K Pix as of 01 Jun 1977

181 EMULSION/PROTONS @ 300 #181 — Arthur S. Cary
HARVEY MUDD COLLEGE

BEAM: Neutrino Area - Miscellaneous
THE DIRECT PRODUCTION OF ELECTRON PAIRS IN NUCLEAR EMULSION BY 100 AND 200 GEV PROTONS.

Request	27 Jul, 72	Emulsion Exposure
Approval	15 Nov, 72	Emulsion Exposure
Completed	20 Oct, 73	3 Stack(s)

183 EMULSION/PROTONS @ 200 #183 — M. I. Tretjakova
LEBEDEV PHYSICAL INST. (RUSSIA)

BEAM: Meson Area - Miscellaneous
A PROPOSAL OF THE PHOTOEMULSION EXPERIMENT AT THE NATIONAL ACCELERATOR LABORATORY (BATAVIA).

Request	7 Jul, 72	Emulsion Exposure
Approval	1 Aug, 72	Emulsion Exposure
Completed	20 Sep, 72	3 Stack(s)

184 PARTICLE SEARCH #184 — Peter J. Wanderer
UNIVERSITY OF CHICAGO
HARVARD UNIVERSITY
UNIVERSITY OF PENNSYLVANIA
UNIVERSITY OF WISCONSIN - MADISON

BEAM: Internal Target Area (C-0)
SEARCH FOR A NEW CLASS OF PENETRATING MASSIVE PARTICLES AT C-0.

Request	14 Sep, 72	Unspecified
Approval	5 Oct, 72	400 Hours with installation to begin at time of removal of exp# 120 and extending for a period of one month
	6 Aug, 73	600 Hours with approval for occupancy at C-0 for 6 weeks
	22 Feb, 74	760 Hours with an authorized extension of 160 hours
Completed	29 May, 74	800 Hours

186 PROTON-DEUTERON SCATTERING #186 — Adrian Melissinos
FERMILAB
JINR, DUBNA (RUSSIA)
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY

BEAM: Internal Target Area (C-0)
A PROPOSAL TO STUDY SMALL ANGLE PROTON-DEUTERON SCATTERING.
(Using a gas jet target with deuterium and the internal proton beam; t from 0.001 - 0.020.)

Request	19 Oct, 72	400 Hours
Approval	1 Nov, 72	400 Hours
Completed	19 Aug, 74	450 Hours

187 PARTICLE SEARCH #187 — Leon M. Lederman
COLUMBIA UNIVERSITY
FERMILAB

BEAM: Proton Area - Center
PHASE 0.8 - SEARCH FOR LONG-LIVED MASSIVE OBJECTS (HIGH ENERGY CALIBRATION RUN).
(Relying on r.f. bunching and time of flight measurement.)

Request	5 Sep, 72	Unspecified
Approval	30 Oct, 72	100 Hours
Completed	6 Nov, 73	200 Hours

188 PROTON-NUCLEON INCLUSIVE #188 — Felix Sannes
UNIV. OF ILLINOIS, CHICAGO CIRCLE
IMPERIAL COLLEGE (ENGLAND)
RUTGERS UNIVERSITY
UPSALA COLLEGE

BEAM: Internal Target Area (C-0)
A PROPOSAL TO MEASURE CROSS SECTIONS FOR P-P TO P-X, N-X AS A FUNCTION OF S AND MX SQUARED USING THE INTERNAL TARGET FACILITY AT NAL.

Request	25 Oct, 72	200 Hours
Approval	1 Nov, 72	200 Hours
Completed	9 May, 73	1,050 Hours

189 EMULSION/PROTONS @ 200 #189 — David Ritson
STANFORD UNIVERSITY

BEAM: Meson Area - Miscellaneous
NUCLEAR EMULSION EXPOSURES TO 400 GEV.
(For student laboratory use.)

Request	16 Oct, 72	Emulsion Exposure
Approval	2 Nov, 72	Emulsion Exposure
Completed	20 Sep, 72	2 Plate(s)

194 30-INCH P - D @ 100 #194 — C. Thornton Murphy
CARNEGIE-MELLON UNIVERSITY
FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR
SUNY AT STONY BROOK

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY PROTON-DEUTERON INTERACTIONS IN THE 30-INCH BUBBLE CHAMBER.

Request	13 Nov, 72	200 K Pix
Approval	1 Mar, 74	100 K Pix in bare chamber with downstream chamber data if it can be arranged
Completed	20 Aug, 76	92 K Pix

195 EMULSION/PROTONS @ 300 #195 — Yu K. Lim
CRFC, CAMBRIDGE
EMMANUEL COLLEGE
MISSISSIPPI STATE UNIVERSITY
UNIVERSITY OF SINGAPORE(SINGAPORE)

BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO MEASURE THE LIFETIME OF THE NEUTRAL PION.

Request	13 Nov, 72	Emulsion Exposure
Approval	15 Nov, 72	Emulsion Exposure
Completed	10 Jun, 75	3 Stack(s)

196 30-INCH P - D @ 400 #196 — Roderich J. Engelmann
CARNEGIE-MELLON UNIVERSITY
FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR
SUNY AT STONY BROOK

BEAM: Neutrino Area - 30 in. Hadron Beam
PROTON-DEUTERON INTERACTIONS IN THE BARE 30-INCH BUBBLE CHAMBER.

Request	13 Nov, 72	100 K Pix
Approval	21 Mar, 74	100 K Pix in bare chamber with downstream chamber data if it can be arranged
Completed	20 Oct, 75	109 K Pix

198A PROTON-NUCLEON SCATTERING #198A — Stephen L. Olsen
IMPERIAL COLLEGE (ENGLAND)
UNIVERSITY OF ROCHESTER
RUTGERS UNIVERSITY

BEAM: Internal Target Area (C-0)
A PROPOSAL FOR A MAGNETIC RECOIL SPECTROMETER FOR THE GAS JET TARGET.
(Use of the gas jet target with H2 and D2 to study p - p and p - d scattering with the internal proton beam; t from 0.15 - 3.0.)

Request	22 Dec, 72	800 Hours
Approval	22 Mar, 74	800 Hours contingent on construction of C-0 extension
	26 Jun, 74	800 Hours with the understanding that concurrent running with exp# 313 be arranged whenever possible
Completed	19 Apr, 77	900 Hours

199 MASSIVE PARTICLE SEARCH #199 — Sherman Frankel
FERMILAB
UNIVERSITY OF PENNSYLVANIA

BEAM: Neutrino Area - Miscellaneous
SEARCH FOR WEAKLY PRODUCED MASSIVE LONG LIVED PARTICLES AT NAL.
(Using a threshold Cerenkov counter.)

Request	21 Dec, 72	Target Exposure(s)
Approval	15 Jan, 73	Target Exposure(s)
Completed	22 Aug, 73	2 Targets Exposed

202 TACHYON MONOPOLE #202 — David F. Bartlett
UNIVERSITY OF COLORADO AT BOULDER
PRINCETON UNIVERSITY

BEAM: Neutrino Area - Miscellaneous
SEARCH FOR TACHYON MONOPOLES IN COSMIC RAYS ABOVE 15-FOOT BUBBLE CHAMBER.
(Using magnet fringe field.)

Request	1 Feb, 73	800 Hours of which half would be at zero field
Approval	22 Aug, 73	Parasitic Running
Completed	19 May, 76	Cosmic Ray Running

203A MUON #203A — Leroy T. Kerth
UNIV. OF CALIFORNIA, BERKELEY
FERMILAB
LAWRENCE BERKELEY LABORATORY
PRINCETON UNIVERSITY

BEAM: Neutrino Area - Muon/Hadron Beam
FEASIBLE SEARCH FOR HEAVY NEUTRAL MUONS PREDICTED BY GAUGE THEORIES AND CONCURRENT MEASUREMENT OF DEEP-INELASTIC VIRTUAL COMPTON SCATTERING.

Request	9 Mar, 73	600 Hours with muon beam intensity of 5 x 10 to the 6th per pulse
Approval	26 Mar, 75	500 Hours with formal approval of 1 x 10 to the 18th protons
	23 Mar, 78	1,200 Hours with the expectation to run the experiment until about April 27, 1978
Completed	18 May, 78	1,200 Hours

205A EMULSION/MUONS @ 150 #205A — Osamu Kusumoto
KINKI UNIVERSITY (JAPAN)
KOBE UNIVERSITY (JAPAN)
OKAYAMA UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)
UNIVERSITY OF TOKYO (JAPAN)

BEAM: Neutrino Area - Miscellaneous
PHENOMENOLOGICAL STUDY OF MUON-NUCLEON COLLISION AT ENERGY MORE THAN 100 GEV IN EMULSION.

Request	4 Apr, 73	Emulsion Exposure
Approval	15 Jun, 73	Emulsion Exposure
Completed	16 Oct, 73	2 Stack(s)

209 30-INCH P - D @ 300 #209 — Fu Tak Dao
CALIFORNIA INSTITUTE OF TECHNOLOGY
IOWA STATE UNIVERSITY
TUFTS UNIVERSITY
VANDERBILT UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
A STUDY OF 300 GEV/C P D INTERACTIONS IN THE THIRTY-INCH BUBBLE CHAMBER.

Request	1 May, 73	50 K Pix
Approval	21 Mar, 74	100 K Pix in bare chamber with downstream chamber data if it can be arranged
Completed	7 Oct, 76	106 K Pix

211 BEAM DUMP #211 — Klaus Goebel
CERN (SWITZERLAND)
FERMILAB

BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR RADIATION MEASUREMENTS AROUND A PROTON BEAM DUMP AT 300 GEV.
(Early measurements to confirm calculations for CERN; very reduced version of exp #108.)

Request	18 Apr, 73	10 Hours with a total of 10 to the 15th protons
Approval	20 Apr, 73	10 Hours
Completed	14 Nov, 73	2 Hours

216 FORM FACTOR #216 — Donald H. Stork
UNIV. OF CALIFORNIA, LOS ANGELES
FERMILAB
JINR, DUBNA (RUSSIA)
NOTRE DAME UNIVERSITY
UNIVERSITY OF PITTSBURGH

BEAM: Meson Area - M1 Beam
A MEASUREMENT OF THE PION FORM FACTOR BY DIRECT PION-ELECTRON SCATTERING.

Request	25 May, 73	630 Hours
Approval	6 Aug, 73	100 Hours for testing and running at 100 GeV to assess background effects
	7 Jul, 75	600 Hours with additional 500 hours of running in M-1 beam line and encouragement to select a single high energy for measurement
Completed	1 Oct, 75	900 Hours

217 30-INCH PI+ & P - P @ 200 #217 — Richard L. Lander
UNIV. OF CALIFORNIA, DAVIS
LAWRENCE BERKELEY LABORATORY
SLAC

BEAM: Neutrino Area - 30 in. Hadron Beam
A COMPARISON OF 100 GEV AND 200 GEV PI+ - P INTERACTIONS.

Request	29 May, 73	50 K Pix
Approval	6 Aug, 73	50 K Pix
Completed	15 May, 74	85 K Pix

218 30-INCH PI- - D @ 200 #218 — Philip Marvin Yager
UNIV. OF CALIFORNIA, DAVIS
INP, KRAKOW (POLAND)
WARSAW UNIVERSITY, INP, (POLAND)
UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - 30 in. Hadron Beam
PION-DEUTERON INTERACTIONS AT 200 GEV/C.

Request	29 May, 73	50 K Pix
Approval	21 Mar, 74	50 K Pix in bare chamber with downstream chamber data if it can be arranged
Completed	18 Sep, 74	72 K Pix

221 PROTON-PROTON INELASTIC #221 — Paolo Franzini — COLUMBIA UNIVERSITY; SUNY AT STONY BROOK
BEAM: Internal Target Area (C-0)
P - P INELASTIC SCATTERING IN THE DIFFRACTIVE REGION.
(Continuation of experiment #14A.)

Request	8 Jun, 73	400 Hours including 200 hours of setup and tuning
Approval	6 Aug, 73	400 Hours
Completed	5 Sep, 74	950 Hours

226 K ZERO CHARGE RADIUS #226 — Valentine L. Telegdi — UNIVERSITY OF CHICAGO; LHE, ETH HONGGERBERG (SWITZERLAND); UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M4 Beam
COHERENT K-SHORT REGENERATION BY ELECTRONS.

Request	12 Jun, 73	720 Hours
	15 Nov, 74	2,100 Hours total for Phase 1, 500 hours in M4 line; and Phase 2, 1600 hours in M3 line
Approval	22 Nov, 74	500 Hours
	30 Jun, 76	600 Hours with a total of 800 hours approved for the combination of E-486 and E-226
Completed	17 Mar, 77	1,200 Hours

228 30-INCH PI+ & P - P @ 60 #228 — Thomas Ferbel — UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF ROCHESTER
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO EXTEND THE ENERGY RANGE OF A STUDY OF MULTIPARTICLE PRODUCTION IN P - P COLLISIONS.
(Request for the remaining pictures for exp #252 to be with a momentum of 60 GeV/c.)

Request	16 Jun, 73	25 K Pix
	20 Feb, 74	35 K Pix total with a pi/p ratio of 5/3
Approval	6 Aug, 73	25 K Pix in bare chamber with tagged beam
	14 Mar, 74	35 K Pix including additional 10K pix and a pi/p ratio of about 5/3
Completed	15 Apr, 74	37 K Pix

229 DETECTOR DEVELOPMENT #229 — Luke C. L. Yuan — BROOKHAVEN NATIONAL LABORATORY
BEAM: Meson Area - M1 Beam
A PROPOSAL FOR TESTING A TRANSITION RADIATION DETECTOR AT NAL.

Request	19 Jun, 73	100 Hours
Approval	23 Aug, 73	Parasitic Running for about 200 hours
Completed	16 Nov, 74	300 Hours

230 MULTIGAMMA #230 — Michael J. Longo — UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Meson Area - M3 Beam
A SEARCH FOR "SCHEIN EVENTS" AND EVENTS WITH A HIGH MULTIPLICITY OF GAMMAS.

Request	25 Jun, 73	40 Hours
Approval	6 Aug, 73	40 Hours with restriction that wide gap chambers will not cause any interference with other experiments in the area
Completed	24 Apr, 74	50 Hours

232 EMULSION/PROTONS @ 300 #232 — David T. King — UNIVERSITY OF TENNESSEE, KNOXVILLE
BEAM: Neutrino Area - Miscellaneous
400-GEV PROTONS ON COMPLEX NUCLEI.

Request	6 Jul, 73	Emulsion Exposure
Approval	16 Aug, 73	Emulsion Exposure
Completed	20 Oct, 73	2 Stack(s)

233 EMULSION/PROTONS @ 300 #233 — Jacques D. Hebert — UNIVERSITY OF BARCELONA (SPAIN); UNIVERSITY OF BELGRADE(YUGOSLAVIA); IAP, BUCHAREST (ROMANIA); CRN, STRASBOURG (FRANCE); FERMILAB; UNIVERSITY OF LUND (SWEDEN); MCGILL UNIVERSITY (CANADA); UNIVERSITY OF NANCY (FRANCE); UNIVERSITY OF OTTAWA (CANADA); UNIV. OF PARIS VI, LPG (FRANCE); UNIVERSITY OF QUEBEC (CANADA); LRC, LYON (FRANCE); INFN, ROME (ITALY); IFC, VALENCIA (SPAIN)
BEAM: Neutrino Area - Miscellaneous
300 GEV (AND 400 GEV) PROTON INTERACTIONS IN NUCLEAR EMULSION.

Request	16 Jul, 73	Emulsion Exposure
Approval	16 Aug, 73	Emulsion Exposure
Completed	20 Oct, 73	8 Stack(s)

234 15-FOOT ENGINEERING RUN #234 — Fred Russell Huson — FERMILAB; FLORIDA STATE UNIVERSITY
BEAM: Neutrino Area - 15 ft. Hadron Beam
AN ENGINEERING RUN FOR THE NAL 15-FOOT CRYOGENIC BUBBLE CHAMBER.

Request	1 Aug, 73	50 K Pix
Approval	6 Aug, 73	50 K Pix
Completed	5 Nov, 74	57 K Pix of pi- - p interactions at 250 GeV/c

236A HADRON JETS #236A — Paul M. Mockett — FERMILAB; TUFTS UNIVERSITY; UNIVERSITY OF WASHINGTON
BEAM: Meson Area - M1 Beam
A PROPOSAL TO EXPLORE THE LARGE-PT DOMAIN: INCLUSIVE CROSS SECTIONS AND POSSIBLE JET STRUCTURE.

Request	13 Aug, 73	550 Hours for tests and data
	16 Dec, 76	1,150 Hours including an additional 400 hours for data and 200 hours for tests
Approval	22 Jan, 74	550 Hours
	1 Apr, 77	1,150 Hours including additional 600 hours to complete experiment during a six week running period
Completed	20 Jul, 77	1,700 Hours

237 EMULSION/PROTONS @ 300 #237 — Jere J. Lord — UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - Miscellaneous
EMULSION EXPOSURE TO 300 GEV PROTONS.

Request	14 Aug, 73	Emulsion Exposure
Approval	11 Sep, 73	Emulsion Exposure
Completed	10 Jun, 75	5 Stack(s)

238 EMULSION/PROTONS @ 400 #238 — Jere J. Lord — UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - Miscellaneous
EMULSION EXPOSURE TO 400 GEV PROTONS.

Request	14 Aug, 73	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	9 Stack(s)

239 LONG-LIVED PARTICLES #239 — William Frati — FERMILAB; UNIVERSITY OF PENNSYLVANIA
BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR A FURTHER SEARCH FOR LONG LIVED PARTICLES AT NAL.
(With a Cerenkov counter looking at the neutrino target from the 90 degree monitor pipe.)

Request	15 Jul, 73	Parasitic Running
Approval	6 Dec, 73	Parasitic Running
Completed	3 Feb, 74	350 Hours

242 EMULSION/PROTONS @ 300 #242 — Kiyoshi Niu — AICHI UNIV. OF EDUCATION (JAPAN); NAGOYA UNIVERSITY (JAPAN); YOKOHAMA NATIONAL UNIV. (JAPAN)
BEAM: Neutrino Area - Miscellaneous
STUDY OF SECONDARY PARTICLES PRODUCED BY 300 GEV PROTONS IN EMULSION CHAMBERS.

Request	28 Sep, 73	Emulsion Exposure
Approval	22 Nov, 73	Emulsion Exposure
Completed	20 Oct, 73	2 Stack(s)

243 EMULSION/PROTONS @ 400 #243 — Kiyoshi Niu — AICHI UNIV. OF EDUCATION (JAPAN); KONAN UNIVERSITY (JAPAN); NAGOYA UNIVERSITY (JAPAN); YOKOHAMA NATIONAL UNIV. (JAPAN)
BEAM: Neutrino Area - Miscellaneous
STUDY OF SECONDARY PARTICLES PRODUCED BY 400 GEV PROTONS IN EMULSION CHAMBERS.

Request	28 Sep, 73	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	7 Stack(s)

244 EMULSION/PROTONS @ 300 #244 — Piyare L. Jain — SUNY AT BUFFALO
BEAM: Neutrino Area - Miscellaneous
INTERACTION OF 300 GEV PROTONS IN NUCLEAR EMULSION.

Request	1 Oct, 73	Emulsion Exposure
Approval	22 Nov, 73	Emulsion Exposure
Completed	20 Oct, 73	1 Stack(s)

245 EMULSION/PROTONS @ 400 #245 — Piyare L. Jain — SUNY AT BUFFALO
BEAM: Neutrino Area - Miscellaneous
INTERACTION OF 400 GEV PROTONS IN NUCLEAR EMULSION.

Request	1 Oct, 73	Emulsion Exposure
Approval	3 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	1 Stack(s)

247 PARTICLE SEARCH #247 — Eric H. S. Burhop — UNIV. COLLEGE DUBLIN (IRELAND); FERMILAB; UNIVERSITY OF LIBRE (BELGIUM); LONDON UNIVERSITY COLLEGE(ENGLAND); INFN, ROME (ITALY); UNIVERSITY OF STRASBOURG (FRANCE)
BEAM: Neutrino Area - Wide Band Horn
A PROPOSED EXPERIMENT TO SEARCH FOR HEAVY LEPTONS.
(Using a hybrid emulsion-spark chamber arrangement.)

Request	21 Sep, 73	1,000 Hours with request for a bombardment of 2 x 10 to the 18th protons
Approval	2 Oct, 73	Unspecified but with expectation of test running for feasibility studies
	26 Mar, 75	1,000 Hours with formal approval for 2 x 10 to the 18th protons subject to the condition that running is compatible with exp# 310 and the 15-ft bubble chamber program
	11 Mar, 76	1,000 Hours with formal approval for 2 x 10 to the 18th protons and high priority
Completed	18 May, 76	350 Hours

248 NEUTRON ELASTIC SCATTERING #248 — Michael J. Longo — UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Meson Area - M3 Beam
NEUTRON-PROTON DIFFRACTION SCATTERING UP TO 300 GEV.
(Differential cross sections with t from 0.1 to 3.5; formerly referred to as exp #4II.)

Request	15 May, 70	700 Hours as an estimate
Approval	1 Aug, 70	400 Hours
Completed	10 Dec, 76	2,400 Hours

249 EMULSION/PROTONS @ 400 #249 — Wladyslaw Wolter — INP, KRAKOW (POLAND)
BEAM: Neutrino Area - Miscellaneous
CRACOW EMULSION EXPOSURE TO 400 GEV PROTONS.

Request	8 Oct, 73	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	3 Stack(s)

250 EMULSION/PROTONS @ 300 #250 — Osamu Kusumoto — KINKI UNIVERSITY (JAPAN); KOBE UNIVERSITY (JAPAN); OSAKA CITY UNIVERSITY (JAPAN); OSAKA SCIENCE EDUC. INST. (JAPAN); WAKAYAMA MEDICAL COLLEGE (JAPAN)
BEAM: Neutrino Area - Miscellaneous
PHENOMENOLOGICAL STUDY OF PROTON-NUCLEUS COLLISION AT NAL ENERGIES IN EMULSION (300 GEV).

Request	10 Oct, 73	Emulsion Exposure
Approval	22 Nov, 73	Emulsion Exposure
Completed	20 Oct, 73	1 Stack(s)

251 EMULSION/PROTONS @ 400 #251 — Osamu Kusumoto — KINKI UNIVERSITY (JAPAN); KOBE UNIVERSITY (JAPAN); OSAKA CITY UNIVERSITY (JAPAN); OSAKA SCIENCE EDUC. INST. (JAPAN); WAKAYAMA MEDICAL COLLEGE (JAPAN)
BEAM: Neutrino Area - Miscellaneous
PHENOMENOLOGICAL STUDY OF PROTON-NUCLEUS COLLISION AT NAL ENERGIES IN EMULSION (400 GEV).

Request	10 Oct, 73	Emulsion Exposure
Approval	22 Oct, 73	Emulsion Exposure
Completed	9 Dec, 75	3 Stack(s)

252 30-INCH P-P @ 100 #252 — Thomas Ferbel — UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF ROCHESTER
BEAM: Neutrino Area - 30 in. Hadron Beam
STUDY OF MULTIPARTICLE PRODUCTION IN A 30-INCH BUBBLE CHAMBER.
(Formerly known as experiment #138I.)

Request	10 May, 71	240 K Pix
Approval	26 Aug, 71	50 K Pix in bare chamber with events where there is downstream spark chamber data to be shared with exp #2B
Completed	6 Dec, 72	33 K Pix

253 NEUTRINO #253 — Luke W. Mo — IHEP, BEIJING (PRC); UNIVERSITY OF MARYLAND; NATIONAL SCIENCE FOUNDATION; UNIVERSITY OF OXFORD (ENGLAND); VIRGINIA TECH

BEAM: Neutrino Area - Wide Band Horn
NEUTRINO-ELECTRON SCATTERING AT NAL.

Request	15 Oct, 73	Parasitic Running expected to total 1,000 hours	
Approval	7 Jul, 75	Parasitic Running	
Completed	7 Mar, 79	2,050 Hours	

254 NEUTRINO #254 — George R. Kalbfleisch — BROOKHAVEN NATIONAL LABORATORY; CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB; PURDUE UNIVERSITY

BEAM: Neutrino Area - Dichromatic
PROPOSAL TO SEARCH FOR A SECOND MUON NEUTRINO.
(Dichromatic beam incident on target calorimeter with muon spectrometer of exp #21A; muon monitoring instrumentation will be added.)

Request	17 Oct, 73	300 Hours	with total flux of 3 x 10 to the 17th protons
Approval	22 Nov, 74	300 Hours	with a formal approval for 3 x 10 to the 17th protons and the hope that running can be coordinated with exp# 21
Completed	15 Oct, 75	550 Hours	

255 EMULSION/MUONS @ 150 #255 — Piyare L. Jain — SUNY AT BUFFALO

BEAM: Neutrino Area - Miscellaneous
EXPOSURE OF NUCLEAR EMULSIONS TO A BEAM OF 150 GEV MUONS AT THE NATIONAL ACCELERATOR LABORATORY.

Request	15 Oct, 73	Emulsion Exposure
Approval	22 Oct, 73	Emulsion Exposure
Completed	16 Oct, 73	1 Stack(s)

258 PION INCLUSIVE #258 — Melvyn Jay Shochet — UNIVERSITY OF CHICAGO; PRINCETON UNIVERSITY

BEAM: Proton Area - West
A PROPOSAL TO MEASURE PARTICLES PRODUCED AT HIGH TRANSVERSE MOMENTUM BY PIONS.

Request	22 Oct, 73	Unspecified	
Approval	26 Jun, 74	800 Hours	contingent upon development of a suitable beam
Completed	9 Jul, 79	1,500 Hours	

260 HADRON JETS #260 — Donald W. McLeod — CALIFORNIA INSTITUTE OF TECHNOLOGY; UNIV. OF CALIFORNIA, LOS ANGELES; FERMILAB; UNIV. OF ILLINOIS, CHICAGO CIRCLE; INDIANA UNIVERSITY; MAX-PLANCK INSTITUTE (GERMANY)

BEAM: Meson Area - M6 Beam
A PROPOSAL TO STUDY HIGH PT PHYSICS WITH A MULTIPARTICLE SPECTROMETER.

Request	26 Oct, 73	650 Hours	
	9 Aug, 76	1,150 Hours	including an extension of 500 hours to complete the experiment
Approval	16 Nov, 73	200 Hours	to come out of the 800 hours previously approved for exp# 110A
	13 Aug, 76	950 Hours	for data including an additional 750 hours with the understanding that the commitment to the experiment is to be complete before a shutdown in September 1976
Completed	20 Sep, 76	2,300 Hours	

261 DETECTOR DEVELOPMENT #261 — Ching Lin Wang — BROOKHAVEN NATIONAL LABORATORY; FERMILAB

BEAM: Meson Area - M1 Beam
PROPOSAL TO TEST TRANSITION COUNTERS AT NAL.

Request	26 Oct, 73	Parasitic Running expected to total 200 hours	
Approval	17 Jan, 74	Parasitic Running for about 200 hours	
Completed	20 Nov, 74	600 Hours	

262 NEUTRINO #262 — Barry C. Barish — CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB

BEAM: Neutrino Area - Dichromatic
NEUTRAL CURRENT INVESTIGATION AT NAL.
(Using the Dichromatic beam, target calorimeter, and spectrometer of exp. #21A.)

Request	28 Oct, 73	300 Hours	to include 3 x 10 to the 17th protons
Approval	16 Nov, 73	300 Hours	with understanding that this will include 3 x 10 to the 17th protons
Completed	20 Mar, 74	400 Hours	

264 EMULSION/PI- @ 200 #264 — Poh Shien Young — MISSISSIPPI STATE UNIVERSITY; UNIVERSITY OF TENNESSEE, KNOXVILLE

BEAM: Neutrino Area - Miscellaneous
EXPOSURE OF EMULSIONS TO 200-300 GEV PI- FOR NEW DETERMINATION OF MEAN LIFE OF PI ZERO.

Request	31 Oct, 73	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	7 Oct, 74	2 Stack(s)

265 EMULSION/PROTONS @ 400 #265 — Poh Shien Young — CRFC, CAMBRIDGE; MISSISSIPPI STATE UNIVERSITY

BEAM: Neutrino Area - Miscellaneous
EXPOSURE OF EMULSIONS TO 400 GEV PROTONS FOR NEW DETERMINATION OF MEAN LIFE OF PI ZERO.

Request	31 Oct, 73	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	3 Stack(s)

268 INCLUSIVE PHOTON #268 — Joel Mellema — BROOKHAVEN NATIONAL LABORATORY; CALIFORNIA INSTITUTE OF TECHNOLOGY; LAWRENCE BERKELEY LABORATORY

BEAM: Meson Area - M2 Beam
A PROPOSAL TO STUDY MESON PRODUCTION AT LARGE P- TRANSVERSE WITH A GAMMA RAY DETECTOR.
(Induced by protons @ 300 GeV and by pi+- @ 100 and 200 GeV; using photon detector of exp #111.)

Request	5 Nov, 73	900 Hours	total with an initial run of 500 hours
	3 Nov, 75	1,200 Hours	including a three-week extension
Approval	21 Mar, 74	100 Hours	of running in diffracted proton beam to demonstrate feasibility
	26 Jun, 74	100 Hours	with formal approval for parasitic running using a pion beam in front of exp# 51
	22 Nov, 74	600 Hours	including an additional 500 hours of running in a pion beam
	10 Nov, 75	900 Hours	including an additional three week run to obtain data at a forward angle with a 200 GeV beam
Completed	11 Feb, 76	1,850 Hours	

271 EMULSION/PROTONS @ 200 #271 — Kurt Gottfried — IAP, BUCHAREST (ROMANIA); CERN (SWITZERLAND); CORNELL UNIVERSITY; UNIVERSITY OF LUND (SWEDEN)
BEAM: Neutrino Area - Miscellaneous
MULTIPARTICLE PRODUCTION IN NUCLEI BY PROTONS OF SEVERAL HUNDRED GEV.
(Using target materials consisting of fine wires imbedded in emulsion or foils covering the emulsion; 200 GeV exposure.)

Request	30 Nov, 73	Emulsion Exposure
Approval	16 Jan, 74	Emulsion Exposure
Completed	10 Jun, 75	10 Stack(s)

272 HADRON DISSOCIATION #272 — Thomas Ferbel — BROOKHAVEN NATIONAL LABORATORY; FERMILAB; UNIVERSITY OF MINNESOTA; UNIVERSITY OF ROCHESTER
BEAM: Meson Area - M1 Beam
PROPOSAL TO MEASURE COHERENT DISSOCIATION OF PI-, K-, AND PBAR INTO TWO-BODY SYSTEMS AT FERMILAB ENERGIES.

Request	3 Dec, 73	600 Hours
	9 Jun, 75	900 Hours total with the additional 300 hours of data taking at 150 and 300 GeV/c incident momentum
Approval	7 Jul, 75	600 Hours
Completed	3 Dec, 79	1,950 Hours

275 PLASTIC DETECTORS #275 — Wolfgang Enge — CHRISTIAN-ALBRECHTS UNIV.(GERMANY)
BEAM: Neutrino Area - Miscellaneous
EXPOSURE OF PLASTIC-DETECTOR STACKS TO A 300 GEV PROTON BEAM AT NAL.

Request	17 Dec, 73	Detector Exposure
Approval	20 Oct, 73	Detector Exposure
Completed	20 Oct, 73	4 Stack(s)

276 QUARK #276 — Andreas Van Ginneken — ARGONNE NATIONAL LABORATORY; UNIVERSITY OF CHICAGO; FERMILAB
BEAM: Neutrino Area - Miscellaneous
A SEARCH FOR STABLE INTEGRALLY CHARGED MASSIVE PARTICLES (HAN-NAMBU QUARKS).
(Mass spectroscopic analysis of irradiated target.)

Request	25 Jan, 74	Target Exposure(s)
Approval	8 Jul, 74	Target Exposure(s)
	30 Aug, 76	Target Exposure(s) with different chemicals and re-exposure of two previous samples
Completed	2 Nov, 75	3 Targets Exposed

279 EMULSION/PROTONS @ 400 #279 — David T. King — UNIVERSITY OF TENNESSEE, KNOXVILLE
BEAM: Neutrino Area - Miscellaneous
THE INTERACTION OF PA=PAE+E- AT 400 GEV.

Request	28 Jan, 74	Emulsion Exposure
Approval	12 Mar, 74	Emulsion Exposure
Completed	9 Dec, 75	3 Stack(s)

280 30-INCH P - D @ 200 #280 — Thomas H. Fields — ARGONNE NATIONAL LABORATORY; CIPP (CANADA); JINR, DUBNA (RUSSIA); MOSCOW STATE UNIVERSITY (RUSSIA)
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY P - D INTERACTIONS AT 205 GEV/C IN THE 30-INCH BUBBLE CHAMBER.

Request	1 Feb, 74	100 K Pix
Approval	21 Mar, 74	100 K Pix in bare chamber with downstream chamber data if it can be arranged
Completed	11 Oct, 75	103 K Pix

281 30-INCH HYBRID #281 — Gerald A. Smith — IOWA STATE UNIVERSITY; UNIVERSITY OF MARYLAND; MICHIGAN STATE UNIVERSITY; NOTRE DAME UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY HIGH ENERGY PROTON-PROTON AND PI-MINUS PROTON INTERACTIONS WITH THE NAL 30-INCH BUBBLE CHAMBER-WIDE GAP SPARK CHAMBER HYBRID SYSTEM.

Request	1 Feb, 74	400 K Pix including 200K pix of p - p 300 GeV and 200K pix of pi- - p at highest momentum
	25 Sep, 74	700 K Pix total including 300K pix of p - p @ 300 GeV, 100K pix of pi- - p @ 100 GeV, and 300K pix of pi- - p @ 375 GeV
Approval	22 Nov, 74	300 K Pix in a combination of pi- and p bombardments at an energy greater than or equal to 300 GeV and with the understanding that following this run work with the wide gap chamber system will be terminated
Completed	28 Sep, 75	301 K Pix of pi- - p interactions at 360 GeV/c

284 PARTICLE PRODUCTION #284 — James K. Walker — FERMILAB; NORTHEASTERN UNIVERSITY; NORTHERN ILLINOIS UNIVERSITY
BEAM: Proton Area - West
SURVEY OF PARTICLE PRODUCTION IN PROTON COLLISIONS AT NAL.
(Continuation of work begun in exp #63A.)

Request	19 Feb, 74	Unspecified
Approval	26 Jun, 74	750 Hours divided roughly as 150 hours for setup and testing and 150 hours each at the four energies of 100, 200, 300, and 400 GeV
Completed	3 Oct, 76	1,150 Hours

285 SUPER-HEAVY ELEMENTS #285 — Leon M. Lederman — COLUMBIA UNIVERSITY; FERMILAB
BEAM: Neutrino Area - Miscellaneous
A SEARCH FOR A NEW STATE OF MATTER IN THE ANALYSIS OF AN NAL BEAM DUMP.

Request	21 Feb, 74	Target Exposure(s)
Approval	27 Feb, 74	Target Exposure(s)
Completed	2 Aug, 76	3 Targets Exposed

288 DI-LEPTON #288 — Leon M. Lederman — COLUMBIA UNIVERSITY; FERMILAB; SUNY AT STONY BROOK
BEAM: Proton Area - Center
A STUDY OF DI-LEPTON PRODUCTION IN PROTON COLLISIONS AT NAL.
(Formerly known as exp #70 III.)

Request	21 Feb, 74	Unspecified
	10 May, 76	1,500 Hours additional for mu-mu II
	10 Nov, 77	4,500 Hours with a request for an additional 3,000 hours for high intensity and high resolution studies
Approval	18 Jan, 74	1,000 Hours
	17 Nov, 76	2,500 Hours with additional 1,500 hours not to extend beyond 1 Sep 1977
	16 Nov, 77	5,500 Hours with an extension of about 3,000 hours until August 1978, and with a request for a progress report in May 1978
Completed	23 Jul, 78	6,850 Hours

289 PROTON-HELIUM SCATTERING #289 — Ernest I. Malamud — UNIVERSITY OF ARIZONA; FERMILAB; JINR, DUBNA (RUSSIA)
BEAM: Internal Target Area (C-0)
SMALL ANGLE PROTON-HELIUM ELASTIC AND INELASTIC SCATTERING FROM 8 TO 500 GEV.
(Using an internal proton beam with a gas jet target.)

Request	1 Mar, 74	700 Hours
Approval	22 Mar, 74	700 Hours conditional upon successful development of the helium jet technique
Completed	8 Nov, 77	1,050 Hours

290 **BACKWARD SCATTERING #290** — Winslow F. Baker — UNIVERSITY OF ARIZONA; FERMILAB

BEAM: Meson Area - M6 Beam
BACKWARD PION-PROTON ELASTIC SCATTERING.
(For u from 0 - 0.8.)

Request	6 Mar, 74	1,100 Hours	including 200 hours for testing
Approval	22 Nov, 74	900 Hours	
Completed	31 Jul, 78	1,500 Hours	

292 **EMULSION/PROTONS @ 400 #292** — Kurt Gottfried — IAP, BUCHAREST (ROMANIA); CERN (SWITZERLAND); CORNELL UNIVERSITY; UNIVERSITY OF LUND (SWEDEN)

BEAM: Neutrino Area - Miscellaneous
MULTIPARTICLE PRODUCTION IN NUCLEI BY PROTONS OF SEVERAL HUNDRED GEV.
(Using target materials consisting of fine wires imbedded in emulsion or foils covering the emulsion; 400 GeV exposure.)

Request	30 Nov, 73	Emulsion Exposure	
Approval	16 Jan, 74	Emulsion Exposure	
Completed	9 Dec, 75	12 Stack(s)	

295 **30-INCH PI+ & P - D @ 200 #295** — Gideon Yekutieli — CRN, STRASBOURG (FRANCE); FERMILAB; WEIZMANN INSTITUTE (ISRAEL)

BEAM: Neutrino Area - 30 in. Hadron Beam
A STUDY OF PI+ - D INTERACTIONS AT 200 GEV/C IN THE 30-INCH BUBBLE CHAMBER AT NAL.

Request	15 Mar, 74	50 K Pix	of p - d @ 205 GeV
	14 Aug, 74	150 K Pix	total including an additional 50K pix due to decreased yield of pi+ - d events
Approval	21 Mar, 74	100 K Pix	in bare chamber with downstream chamber data if it can be arranged; and with request that interest be switched from p - d to pi+ - d bombardment
	27 Aug, 74	150 K Pix	with additional 50K pix to yield the requested number of pi+ - d
Completed	2 Nov, 75	156 K Pix	

297 **QUARK #297** — Lawrence B. Leipuner — BROOKHAVEN NATIONAL LABORATORY

BEAM: Neutrino Area - 30 in. Hadron Beam
QUARK SEARCH USING 400-500 GEV PROTONS.
(By measuring ionization energy loss.)

Request	15 Apr, 74	24 Hours	with beam of 5 x 10 to the 4th particles/pulse and a 200 msec spill
Approval	15 May, 74	24 Hours	
Completed	10 Jul, 74	50 Hours	

299 **30-INCH HYBRID #299** — Irwin A. Pless — BROWN UNIVERSITY; UNIVERSITY OF CAMBRIDGE (ENGLAND); FERMILAB; ILLINOIS INSTITUTE OF TECHNOLOGY; UNIVERSITY OF ILLINOIS, CHAMPAIGN; INDIANA UNIVERSITY; JOHNS HOPKINS UNIVERSITY; UNIVERSITY OF L'ETAT (BELGIUM); MASSACHUSETTS INST. OF TECHNOLOGY; SUNY AT ALBANY; NIJMEGEN UNIVERSITY (NETHERLANDS); OAK RIDGE NATIONAL LABORATORY; RUTGERS UNIVERSITY; STEVENS INSTITUTE OF TECHNOLOGY; UNIVERSITY OF TENNESSEE, KNOXVILLE; YALE UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
PRECISION STUDY OF HIGH ENERGY COLLISIONS INDUCED BY INCIDENT 150 GEV/C PIONS AND PROTONS.
(Using the downstream PWC hybrid system.)

Request	16 May, 74	1,200 K Pix	at 150 GeV equally split between study of p - p, pi- - p, and pi+ - p interactions
Approval	22 Nov, 74	600 K Pix	of pi- - p, p - p, and pi+ - p interactions at 150 GeV/c
	6 Aug, 76	500 K Pix	to be pi+ - p @ 150 GeV/c in 30-inch bubble chamber with PWC hybrid system and with 100K pix of pi- - p now included in approval for exp# 393
	28 Oct, 76	660 K Pix	with additional 160K pix from a collaboration with proposal #375 to provide an overall package of 500K pix to be taken in an enriched K+ mode; 160K pix already taken at this time
Completed	22 Nov, 76	431 K Pix	with 229K pix remaining to be taken under earlier approval when declared complete on 29 Jun 1977

300 **PARTICLE SEARCH #300** — Pierre A. Piroue — UNIVERSITY OF CHICAGO; PRINCETON UNIVERSITY

BEAM: Proton Area - East
STUDY OF PARTICLE PRODUCTION AT HIGH TRANSVERSE MOMENTA USING HYDROGEN AND DEUTERIUM TARGETS.

Request	16 May, 74	1,200 Hours	with a liquid hydrogen/deuterium target and at beam energies of 200, 300, 400, and 500 GeV
Approval	26 Jun, 74	600 Hours	with hydrogen target
Completed	24 Apr, 76	750 Hours	

305 **NEUTRON DISSOCIATION #305** — Bruno Gobbi — FERMILAB; NORTHWESTERN UNIVERSITY; UNIVERSITY OF ROCHESTER; SLAC

BEAM: Meson Area - M3 Beam
PROPOSAL TO STUDY THE COHERENT DISSOCIATION OF NEUTRONS.
(A continuation of work begun in exp #27A.)

Request	22 May, 74	1,200 Hours	total to include one month of running every four months through calendar 1975
Approval	26 Jun, 74	900 Hours	without approval for the installation of the transmission target for H2 and D2 cross section measurements
	16 Dec, 74	1,200 Hours	with additional 300 hours for particle search
Completed	14 Apr, 75	1,400 Hours	

310 NEUTRINO #310 — David B. Cline — FERMILAB; HARVARD UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; RUTGERS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - Wide Band Horn
FURTHER STUDY OF HIGH ENERGY NEUTRINO INTERACTIONS AT FERMILAB.

Request	4 Jun, 74	Unspecified	
	1 Feb, 78	1,200 Hours	to include 2 x 10 to the 18th protons on target with the Wide Band Horn system focused for negatives without a plug and 2 x 10 to the 18th for positives
Approval	22 Nov, 74	1,000 Hours	with a formal approval for 2 x 10 to the 18th protons and the understanding that use will be made of a horn focusing system
	17 Nov, 76	1,000 Hours	to also include running with the Quadrupole Triplet train for an exposure of 1 x 10 to the 18th protons during December 1976
	15 Mar, 77	2,500 Hours	with formal additional approval as follows--1 - 2 x 10 to the 18th protons using the sign-selected-bare-target train understood to focus antineutrinos, and 2 x 10 to the 18th protons using the Quadrupole Triplet train load
	21 Mar, 78	3,500 Hours	with additional approval for a final run to complete the experiment during wide-band horn running for the 15-ft bubble chamber
Completed	31 Aug, 78	3,800 Hours	at the request of the experimenters, because it was felt that the conditions required to properly continue the experiment could not be met.

311 30-INCH PBAR - P @ 100 #311 — William W. Neale — UNIVERSITY OF CAMBRIDGE (ENGLAND); FERMILAB; MICHIGAN STATE UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY MULTIPARTICLE PRODUCTION IN HIGH ENERGY ANTIPROTON-PROTON INTERACTIONS WITH THE FERMILAB 30-INCH BUBBLE CHAMBER.

Request	6 Jun, 74	100 K Pix	with equal numbers of pbar and pi-
Approval	26 Jun, 74	100 K Pix	to be obtained with not more than 200K pulses of the chamber
Completed	27 Jan, 75	98 K Pix	

313 PROTON-PROTON POLARIZATION #313 — Homer A. Neal — INDIANA UNIVERSITY

BEAM: Internal Target Area (C-0)
POLARIZATION IN P - P ELASTIC, INELASTIC AND INCLUSIVE REACTIONS AT FERMILAB ENERGIES.
(Using a gas jet target with hydrogen, the internal proton beam, the spectrometer of exp #198A, and a new carbon polarimeter.)

Request	5 Jun, 74	1,500 Hours	total with two jet pulses per cycle
Approval	26 Jun, 74	1,000 Hours	with about 800 hours of running on polarization in elastic scattering and about 200 hours of running to observe polarization in inelastic channels
	15 Mar, 77	1,000 Hours	with encouragement to use some of the remaining running to accumulate further data on polarization in inelastic processes; see proposal #522
Completed	30 Mar, 77	850 Hours	with some approved running remaining; see exp #522

317 PROTON-NUCLEON INELASTIC #317 — Rodney L. Cool — UNIVERSITY OF ARIZONA; FERMILAB; JINR, DUBNA (RUSSIA); UNIVERSITY OF ROCHESTER; ROCKEFELLER UNIVERSITY

BEAM: Internal Target Area (C-0)
PROTON DIFFRACTION DISSOCIATION ON HYDROGEN AND DEUTERIUM.
(Using the gas jet target and internal proton beam.)

Request	7 Jun, 74	800 Hours	for tests and data taking
Approval	3 Jul, 74	800 Hours	using gas jet with running to be interleaved with exp# 321
Completed	1 Nov, 75	1,400 Hours	

319 MUON #319 — K. Wendell Chen — FERMILAB; MICHIGAN STATE UNIVERSITY

BEAM: Neutrino Area - Muon/Hadron Beam
FURTHER TEST OF SCALING AT HIGH MOMENTUM TRANSFERS IN DEEP INELASTIC MUON SCATTERING.
(A continued exploration of the studies begun in exp #26.)

Request	10 Jun, 74	1,100 Hours	
Approval	26 Mar, 75	500 Hours	for a scaling test at high energies
Completed	20 Sep, 76	900 Hours	

320 NEUTRINO #320 — Frank J. Sciulli — CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB

BEAM: Neutrino Area - Dichromatic
PROPOSAL TO MEASURE NEUTRAL CURRENT CROSS-SECTIONS AND ASSOCIATED INELASTIC DISTRIBUTIONS IN THE NARROW-BAND BEAM.

Request	10 Jun, 74	1,200 Hours	with request of 3 x 10 to the 18th protons total and initial run of 1 x 10 to the 18th protons for investigation
Approval	26 Jun, 74	500 Hours	with a formal approval for 1 x 10 to the 18th protons pending a positive finding of neutral currents and with the inclination to assign higher priority for running to exp# 320 than to completion of exp# 21
Completed	1 Oct, 74	500 Hours	

321 PROTON-PROTON INELASTIC #321 — Juliet Lee-Franzini — COLUMBIA UNIVERSITY; SUNY AT STONY BROOK

BEAM: Internal Target Area (C-0)
A HIGH PRECISION EXPERIMENT TO MEASURE THE INELASTIC P - P CROSS SECTION AND ITS ASSOCIATED FORWARD MULTIPLICITIES AT SMALL MOMENTUM TRANSFER.
(Using a new hydrogen gas jet target and the internal proton beam.)

Request	11 Jun, 74	2,000 Hours	total including 800 hours for testing
Approval	3 Jul, 74	800 Hours	with running to be interleaved with exp# 317 and using the existing cryogenic hydrogen jet
	26 Mar, 75	800 Hours	with approval to use a room temperature gas jet of their own design
Completed	20 Sep, 76	1,900 Hours	

324 INCLUSIVE SCATTERING #324 — Howard L. Weisberg — UNIVERSITY OF PENNSYLVANIA

BEAM: Meson Area - M1 Beam
A PROPOSAL TO STUDY SINGLE PARTICLE INCLUSIVE SPECTRA IN HIGH ENERGY HADRON-HADRON COLLISIONS

Request	11 Apr, 74	1,000 Hours	
Approval	24 Jun, 74	500 Hours	
Completed	13 Aug, 77	1,200 Hours	

325 PARTICLE SEARCH #325 — Pierre A. Piroue — UNIVERSITY OF CHICAGO; PRINCETON UNIVERSITY

BEAM: Proton Area - East
STUDY OF DI-MUON PRODUCTION AT HIGH TRANSVERSE MOMENTA.

Request	12 Jun, 74	Parasitic Running	
Approval	25 Nov, 74	Parasitic Running	with the stipulation that this running time will be concurrent with the previously approved 600 hours for exp# 300
	6 May, 76	600 Hours	for a portion of the program estimated to require 13 weeks and with the expectation to continue the experiment during another running period
	26 Oct, 76	1,200 Hours	during a six-week running period to begin in January 1977
Completed	28 Feb, 77	1,500 Hours	

326 DI-MUON #326 — Melvyn Jay Shochet — UNIVERSITY OF CHICAGO, PRINCETON UNIVERSITY
BEAM: Proton Area - West
PROPOSAL TO MEASURE MUON PAIRS PRODUCED AT HIGH TRANSVERSE MOMENTUM BY PIONS.

Request	29 May, 74	Unspecified	
	7 Jul, 75	400 Hours	
	2 Feb, 77	800 Hours	to be run in conjunction with exp #258 in the P-West pion beam by adding a second arm to the exp #258 spectrometer
Approval	15 Mar, 77	800 Hours	
Completed	26 Apr, 82	2,000 Hours	

327 DETECTOR DEVELOPMENT #327 — Wade W. M. Allison — MASSACHUSETTS INST. OF TECHNOLOGY, UNIVERSITY OF OXFORD (ENGLAND)
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO TEST PARTICLE IDENTIFICATION BY IONIZATION LOSS (ISIS).

Request	15 Jul, 74	400 Hours
Approval	31 Jul, 74	50 Hours
Completed	7 Feb, 75	50 Hours

328 EMULSION/PI- @ 200 #328 — M. I. Tretjakova — LEBEDEV PHYSICAL INST. (RUSSIA)
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY THE INTERACTIONS OF PI- MESONS IN NUCLEAR EMULSION AT THE FERMILAB ACCELERATOR.

Request	5 Aug, 74	Emulsion Exposure
Approval	5 Aug, 74	Emulsion Exposure
Completed	7 Oct, 74	5 Stack(s)

329 EMULSION/PROTONS @ 300 #329 — M. I. Tretjakova — LEBEDEV PHYSICAL INST. (RUSSIA)
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY THE INTERACTIONS OF PROTONS IN NUCLEAR EMULSION AT THE FERMILAB ACCELERATOR.

Request	5 Aug, 74	Emulsion Exposure
Approval	3 Jun, 75	Emulsion Exposure
Completed	10 Jun, 75	2 Stack(s)

330 PARTICLE SEARCH #330 — H. Richard Gustafson — UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Meson Area - M4 Beam
SEARCH FOR MASSIVE NEUTRAL PARTICLES.
(Using time-of-flight and a total absorption calorimeter.)

Request	6 Aug, 74	1,300 Hours	to include 800 hours for tuneup parasitic to exp #305 and 500 hours for data
Approval	22 Jan, 75	100 Hours	
Completed	7 Jul, 75	150 Hours	

331 DI-MUON #331 — James E. Pilcher — UNIVERSITY OF CHICAGO, PRINCETON UNIVERSITY
BEAM: Neutrino Area - Muon/Hadron Beam
PROPOSAL FOR A DETAILED STUDY OF DI-MUON PRODUCTION.
(Alternative version of exps #308 & #323 designed for muon laboratory cyclotron spectrometer.)

Request	10 Aug, 74	Unspecified	
Approval	25 Nov, 74	400 Hours	for an initial run at an incident beam intensity of about 10 to the 6th particles/pulse
Completed	22 Mar, 76	1,400 Hours	

335 MUON SEARCH #335 — Orrin D. Fackler — CALIFORNIA INSTITUTE OF TECHNOLOGY, UNIVERSITY OF CHICAGO, FERMILAB, PRINCETON UNIVERSITY, ROCKEFELLER UNIVERSITY
BEAM: Meson Area - M1 Beam
A SEARCH FOR DIRECT MUON PRODUCTION IN THE FORWARD DIRECTION.

Request	18 Aug, 74	200 Hours	total including time for tests and data
Approval	22 Nov, 74	200 Hours	provided that this running time can be arranged in such a way as not to interfere substantially with the ongoing physics program in the M1 beam line
Completed	6 Jun, 75	300 Hours	

336 EMULSION/PROTONS @ 400 #336 — Takeshi Ogata — KWANSEI GAKUIN UNIVERSITY (JAPAN)
BEAM: Neutrino Area - Miscellaneous
MULTIPARTICLE PRODUCTION IN NUCLEON-NUCLEUS COLLISIONS AT 400 GEV.

Request	9 Sep, 74	Emulsion Exposure
Approval	19 Oct, 74	Emulsion Exposure
Completed	9 Dec, 75	2 Stack(s)

337 DI-MUON #337 — David P. Eartly — FERMILAB, MAX-PLANCK INSTITUTE (GERMANY)
BEAM: Meson Area - Miscellaneous
MEASUREMENT OF DI-MUON EVENTS IN THE MESON AREA.

Request	20 Sep, 74	3 Hours
Approval	27 Sep, 74	3 Hours
Completed	7 Feb, 75	5 Hours

338 30-INCH PI- - D @ 360 #338 — Keihachiro Moriyasu — UNIV. OF CALIFORNIA, DAVIS; INP, KRAKOW (POLAND); WARSAW UNIVERSITY, INP, (POLAND); UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - 30 in. Hadron Beam
PION-DEUTERON INTERACTIONS AT 400 GEV/C.

Request	21 Sep, 74	100 K Pix	
Approval	24 Sep, 74	50 K Pix	in bare chamber with downstream chamber data if it can be arranged
Completed	28 Aug, 76	53 K Pix	

339 EMULSION/PI- @ 200 #339 — Wladyslaw Wolter — INP, KRAKOW (POLAND)
BEAM: Neutrino Area - Miscellaneous
CRACOW EMULSION EXPOSURE TO 200 GEV PIONS.

Request	12 Sep, 74	Emulsion Exposure
Approval	1 Oct, 74	Emulsion Exposure
Completed	9 Jun, 75	4 Stack(s)

340 EMULSION/ELECTRONS @ HI E #340 — Shoji Dake — KOBE UNIVERSITY (JAPAN); KONAN UNIVERSITY (JAPAN); SAITAMA UNIVERSITY (JAPAN); UNIVERSITY OF TOKYO (JAPAN); UTSUNOMIYA UNIVERSITY (JAPAN); WASEDA UNIVERSITY (JAPAN)
BEAM: Proton Area - Miscellaneous
STUDY OF THE ELECTRON-PHOTON CASCADE SHOWER IN LEAD ABSORBER.

Request	25 Sep, 74	Emulsion Exposure
Approval	10 Oct, 74	Emulsion Exposure
Completed	5 Oct, 76	10 Stack(s)

341 15-FOOT P - P @ 400 #341 — Winston Ko — UNIV. OF CALIFORNIA, DAVIS; LAWRENCE BERKELEY LABORATORY
BEAM: Neutrino Area - 15 ft. Hadron Beam
INTERACTIONS OF PI+ MESONS AND PROTONS IN A HYDROGEN-NEON MIXTURE.

Request	1 Oct, 74	100 K Pix	
Approval	4 Dec, 74	25 K Pix	of tagged pi+ and p at 150 GeV in H2 to develop analysis techniques for 15-foot bubble chamber film
	8 Dec, 75	25 K Pix	of p - p interactions at 400 GeV
Completed	21 Dec, 75	34 K Pix	

343 15-FOOT P - P @ 300 #343 — Roderich J. Engelmann — ARGONNE NATIONAL LABORATORY; UNIVERSITY OF KANSAS; SUNY AT STONY BROOK; TUFTS UNIVERSITY
BEAM: Neutrino Area - 15 ft. Hadron Beam
PROPOSAL TO STUDY NEUTRAL PARTICLE PRODUCTION IN 250 GEV P - P INTERACTIONS IN THE FERMILAB 15-FOOT BUBBLE CHAMBER.

Request	3 Oct, 74	25 K Pix	
Approval	4 Dec, 74	25 K Pix	
Completed	13 Jan, 76	27 K Pix	

344 30-INCH PBAR - P @ 50 #344 — Laszlo J. Gutay — CNTRL RES INST, BUDAPEST (HUNGARY); FERMILAB; PURDUE UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO SURVEY CENTRAL COLLISIONS IN PBAR - P TO MESONS BETWEEN 30 AND 60 GEV/C IN THE 30-INCH BUBBLE CHAMBER AT FERMILAB.

Request	4 Oct, 74	100 K Pix	to be taken in < 200K chamber expansions
Approval	27 Nov, 74	100 K Pix	with the qualification that it must be possible to obtain these pictures in no more than one calender month of running time
Completed	1 Nov, 76	145 K Pix	

345 30-INCH PBAR - D @ 100 #345 — Gosta Ekspong — UNIVERSITY OF LIVERPOOL (ENGLAND); UNIVERSITY OF STOCKHOLM (SWEDEN); VANDERBILT UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL TO STUDY MULTIPARTICLE PRODUCTION IN 100 GEV/C ANTI-PROTON-DEUTERIUM INTERACTIONS WITH THE FERMILAB 30-INCH BUBBLE CHAMBER.

Request	5 Oct, 74	100 K Pix	with a Cerenkov tagged incoming beam
Approval	4 Dec, 74	100 K Pix	with the qualification that serious consideration be given to the use of the FWC downstream system
Completed	7 Sep, 76	61 K Pix	with 39K pix remaing to be taken under earlier approval when declared complete on 29 Jun 1977

346 EMULSION/PROTONS @ 400 #346 — Gosta Ekspong — UNIVERSITY OF STOCKHOLM (SWEDEN)
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR HEAVY, SHORTLIVED PARTICLES.

Request	6 Oct, 74	Emulsion Exposure	
Approval	21 Oct, 74	Emulsion Exposure	
Completed	9 Dec, 75	1 Stack(s)	

350 INCLUSIVE NEUTRAL MESON #350 — Robert W. Kenney — BROOKHAVEN NATIONAL LABORATORY; CALIFORNIA INSTITUTE OF TECHNOLOGY; LAWRENCE BERKELEY LABORATORY
BEAM: Meson Area - M2 Beam
A PROPOSAL TO STUDY NEUTRAL PIONS AND MESON INCLUSIVE PRODUCTION WITH INCIDENT NEGATIVE PIONS IN THE TRIPLE REGGE REGION.
(Using the photon detector of exp #111.)

Request	11 Oct, 74	500 Hours	
Approval	21 Nov, 74	400 Hours	
	16 Dec, 74	400 Hours	with up to 150 hours approved for a particle search with the condition that this time be included within the 900 hours already approved for exps# 268 and 350
Completed	24 Feb, 77	900 Hours	

356 NEUTRINO #356 — Frank J. Sciulli — CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB; UNIVERSITY OF ROCHESTER; ROCKEFELLER UNIVERSITY
BEAM: Neutrino Area - Dichromatic
STUDIES OF DEEP INELASTIC DIFFERENTIAL DISTRIBUTIONS AT HIGH ENERGIES FOR NEUTRINO AND ANTI-NEUTRINO BEAMS.
(A continuation of the work begun in exp #21A with a new narrow band beam and changed apparatus.)

Request	18 Oct, 74	1,000 Hours	
Approval	22 Nov, 74	1,000 Hours	with a formal commitment of 2 x 10 to the 18th protons contingent on the feasibility of developing the improved Dichromatic beam
Completed	17 Jan, 79	1,350 Hours	

357 PARTICLE SEARCH #357 — Donald I. Meyer — FERMILAB; UNIVERSITY OF MICHIGAN - ANN ARBOR; PURDUE UNIVERSITY
BEAM: Meson Area - M2 Beam
A PROPOSAL TO SEARCH FOR CHARMED PARTICLES AND MEASUREMENTS OF TWO-PARTICLE INCLUSIVE CROSS SECTIONS AT LARGE P-TRANSVERSE.
(Employing a two-arm magnetic spectrometer.)

Request	19 Oct, 74	2,400 Hours	
Approval	16 Dec, 74	600 Hours	
Completed	7 Jun, 76	1,700 Hours	

358 DI-MUON #358 — Wonyong Lee — COLUMBIA UNIVERSITY; CORNELL UNIVERSITY; FERMILAB; UNIVERSITY OF HAWAII AT MANOA; UNIVERSITY OF ILLINOIS, CHAMPAIGN
BEAM: Proton Area - East
DI-MUON PRODUCTION BY NEUTRONS.

Request	20 Oct, 74	Unspecified	
Approval	27 Nov, 74	300 Hours	of neutron running to be interleaved within the 600 hours already approved for exp# 87A
Completed	1 Oct, 75	400 Hours	

361 LAMBDA BETA-DECAY #361 — Lee G. Pondrom — UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF MINNESOTA; RUTGERS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
PRECISION MEASUREMENT OF LAMBDA BETA DECAY PARAMETERS.
(Will run with experimental set-up for neutral hyperon #8.)

Request	14 Nov, 74	300 Hours	
	23 Jan, 76	350 Hours	total including 150 hours in unpolarized lambda-zero beam and 200 hours in polarized lambda-zero beam
Approval	15 Nov, 77	300 Hours	
Completed	29 Oct, 79	1,250 Hours	

362 EMULSION/PI- @ 200 #362 — Piyare L. Jain — SUNY AT BUFFALO
BEAM: Neutrino Area - Miscellaneous
INTERACTION OF 200 - 400 GEV PIONS WITH EMULSION NUCLEI.

Request	15 Nov, 74	Emulsion Exposure	
Approval	25 Nov, 74	Emulsion Exposure	
Completed	9 Jun, 75	1 Stack(s)	

363 PARTICLE SEARCH #363 — Stephen L. Olsen — FLORIDA STATE UNIVERSITY; IMPERIAL COLLEGE (ENGLAND); UNIVERSITY OF ROCHESTER; RUTGERS UNIVERSITY

BEAM: Internal Target Area (C-0)
A PROPOSAL TO SEARCH FOR CHARMED PARTICLE PRODUCTION NEAR THRESHOLD.

Request	24 Nov, 74	Unspecified	
Approval	16 Dec, 74	500 Hours	of running with the rotating carbon filament target
Completed	9 Apr, 75	650 Hours	

365 PARTICLE SEARCH #365 — David A. Garelick — NORTHEASTERN UNIVERSITY

BEAM: Meson Area - M2 Beam
A PROPOSAL TO SEARCH FOR THE PRODUCTION OF CHARMED MESONS IN PI - P INTERACTIONS.

Request	27 Nov, 74	200 Hours	including 40 hours for testing
Approval	31 Dec, 74	200 Hours	during a two week run with a passive, nonmagnetized steel absorber to be used in conjunction with a muon trigger
Completed	5 Feb, 75	200 Hours	

366 PARTICLE SEARCH #366 — Maris A. Abolins — CARELTON UNIVERSITY (CANADA); FERMILAB; MICHIGAN STATE UNIVERSITY; OHIO STATE UNIVERSITY

BEAM: Meson Area - M3 Beam
STUDY OF HEAVY, NARROW MESONS USING A MASS-FOCUSING SPECTROMETER.
(Experiment consists mainly of rearranged components from exp #12.)

Request	27 Nov, 74	Unspecified	
Approval	16 Dec, 74	600 Hours	for a particle search to be slanted particularly toward an identification of charmed mesons
	24 Nov, 75	1,200 Hours	with an additional 600 hours to explore the possibility of a mass peak in the K- pi+ mass spectrum
Completed	2 Jul, 76	2,500 Hours	

369 PARTICLE SEARCH #369 — Thomas B. W. Kirk — FERMILAB; HARVARD UNIVERSITY; UNIVERSITY OF ILLINOIS, CHAMPAIGN; MAX-PLANCK INSTITUTE (GERMANY); TUFTS UNIVERSITY

BEAM: Neutrino Area - Muon/Hadron Beam
A SEARCH FOR CHARMED PARTICLES.
(Using the spectrometer originally developed for exp #98.)

Request	9 Dec, 74	700 Hours	for data with 300 pulses/hour and 1 x 10 to the 6th pi-/pulse
Approval	17 Mar, 76	600 Hours	
Completed	13 Aug, 77	1,000 Hours	

370 NEUTRINO #370 — David B. Cline — FERMILAB; HARVARD UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - Quadrupole Triplet
CONTINUED SEARCH FOR NEW PARTICLE PRODUCTION USING THE EXP #1A DETECTOR.

Request	9 Dec, 74	500 Hours	with a total of 1 x 10 to the 18th protons and a 1 msec spill
Approval	7 Jul, 75	500 Hours	with the hope of providing 1 x 10 to the 18th protons
Completed	19 Mar, 75	400 Hours	

371 SUPER-HEAVY ELEMENTS #371 — Mira Juric — UNIVERSITY OF BELGRADE(YUGOSLAVIA)

BEAM: Meson Area - Miscellaneous
INVESTIGATION OF THE PRODUCTION OF HEAVY FRAGMENTS INDUCED BY PARTICLES OF HIGH ENERGIES.

Request	2 Dec, 74	Target Exposure(s)	
Approval	12 Mar, 75	Target Exposure(s)	
Completed	20 Dec, 75	2 Stack(s)	

373 EMULSION/MUONS @ 200 #373 — Piyare L. Jain — SUNY AT BUFFALO

BEAM: Neutrino Area - Miscellaneous
INTERACTION OF 50 - 100 GEV MUONS WITH EMULSION NUCLEI.

Request	8 Jul, 75	Emulsion Exposure	
Approval	24 Sep, 76	Emulsion Exposure	to muons @ 225 GeV/c and with an intensity not to exceed 50K particles/sq cm
Completed	22 Nov, 76	2 Stack(s)	

374 EMULSION/PROTONS @ 300 #374 — D. H. Davis — UNIVERSITY OF BELGRADE(YUGOSLAVIA); UNIV. COLLEGE DUBLIN (IRELAND); INP, KRAKOW (POLAND); UNIVERSITY OF LIBRE (BELGIUM); LONDON UNIVERSITY COLLEGE(ENGLAND); THE OPEN UNIVERSITY (ENGLAND); INFN, ROME (ITALY); UNIVERSITY OF STRASBOURG (FRANCE); WARSAW UNIVERSITY, INP, (POLAND)

BEAM: Neutrino Area - Miscellaneous
A PROPOSAL TO SEARCH FOR CHARMED PARTICLES ORIGINATING FROM INTERACTIONS OF 300 GEV/C PROTONS IN EMULSION NUCLEI.

Request	25 Jan, 74	Emulsion Exposure	
Approval	12 Mar, 75	Emulsion Exposure	with the understanding that exp# 374 will replace exp# 364
Completed	10 Jun, 75	1 Stack(s)	

379 PARTICLE SEARCH #379 — Stanley G. Wojcicki — CALIFORNIA INSTITUTE OF TECHNOLOGY; UNIVERSITY OF ROCHESTER; STANFORD UNIVERSITY

BEAM: Neutrino Area - 15 ft. Hadron Beam
SEARCH FOR SHORT LIVED STATES DECAYING WEAKLY VIA LEPTONIC MODES.

Request	5 Feb, 75	1,000 Hours	
Approval	26 Mar, 75	200 Hours	for testing and initial data taking
	17 Nov, 76	600 Hours	with 400 hours for high priority running and with the expectation that a second 400 hour run will be approved if preliminary analysis of initial results are satisfactory
	15 Mar, 77	600 Hours	with a hope of combining the two requested running periods into a single block of running but with the understanding that the total number of hours would be somewhat less than requested
Completed	8 Jun, 77	1,250 Hours	

380 15-FOOT NEUTRINO/H2&NE #380 — Charles Baltay — BROOKHAVEN NATIONAL LABORATORY; COLUMBIA UNIVERSITY

BEAM: Neutrino Area - Dichromatic
STUDY OF THE PROPERTIES OF WEAK NEUTRAL CURRENTS IN THE INTERACTIONS OF A NARROW BAND NEUTRINO BEAM IN LIQUID NEON.

Request	6 Feb, 75	200 K Pix	
Approval	7 Jul, 75	200 K Pix	in a heavy neon-hydrogen mixture contingent upon the construction and adequate performance of an improved narrow-band beam
	24 Jun, 77	200 K Pix	at higher energies using the D C Dichromatic train; new requests for use of the Dichromatic horn to be considered later
Completed	31 Oct, 79	196 K Pix	

381 PROTON-NUCLEON SCATTERING #381 — Ernest I. Malamud — UNIVERSITY OF ARIZONA; FERMILAB; JINR, DUBNA (RUSSIA); UNIVERSITY OF ROCHESTER

BEAM: Internal Target Area (C-0)
MEASUREMENT OF THE REAL PART OF THE P - N AND P - P FORWARD SCATTERING AMPLITUDES; PRODUCTION OF LOW MASS ISOBARS IN THE VERY SMALL MOMENTUM TRANSFER REGION.
(Uses gas jet target.)

Request	20 Feb, 75	300 Hours
Approval	26 Mar, 75	300 Hours
Completed	30 Mar, 77	600 Hours

382 PARTICLE SEARCH #382 — Louis N. Hand — CORNELL UNIVERSITY; FERMILAB; INP, KRAKOW (POLAND); MICHIGAN STATE UNIVERSITY; UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - Muon/Hadron Beam
A SEARCH FOR CHARMED HADRONS PRODUCED BY MUON DEEP INELASTIC SCATTERING IN TAGGED NUCLEAR EMULSIONS.
(Using drift chambers to locate events and reduce scanning time.)

Request	21 Feb, 75	Emulsion Exposure
Approval	26 Mar, 75	Emulsion Exposure with a provision that it does not seriously interfere with the rest of the muon and neutrino program
	24 Nov, 75	Emulsion Exposure with a bombardment of five days duration during December 1975
Completed	19 Dec, 75	200 Hours

383 INCLUSIVE K-SHORT #383 — Hans G. E. Kobrak — UNIV. OF CALIFORNIA, DAVIS; UNIV. OF CALIFORNIA, SAN DIEGO; CARELTON UNIVERSITY (CANADA); MICHIGAN STATE UNIVERSITY

BEAM: Meson Area - M4 Beam
A PROPOSAL TO STUDY THE INCLUSIVE PRODUCTION OF K ZERO SHORT BY K MINUS ON HYDROGEN.
(To use the M4 line as a charged beam at momenta of 20 - 150 GeV/c.)

Request	24 Feb, 75	500 Hours
Approval	29 Jun, 76	500 Hours with 200 hours for setup and original run and 300 hours for final run
Completed	7 May, 78	2,200 Hours

385 EMULSION/PROTONS @ 400 #385 — Yog Prakash — DELHI UNIVERSITY (INDIA); JAMMU UNIVERSITY (INDIA); PANJAB UNIVERSITY (INDIA); RAJASTHAN UNIVERSITY (INDIA)

BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR EXPOSURE OF A STACK OF NUCLEAR EMULSIONS TO PROTONS OF 400 GEV/C.

Request	5 Mar, 75	Emulsion Exposure
Approval	11 Mar, 75	Emulsion Exposure
Completed	9 Dec, 75	1 Stack(s)

386 EMULSION/NEW PARTICLES #386 — Jere J. Lord — UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - Miscellaneous
A SEARCH FOR LOW ENERGY NEUTRAL PARTICLES AND PARTICLE INTERACTIONS INVOLVING SMALL ENERGY EXCHANGES IN THE NEUTRINO BEAM.

Request	7 Mar, 75	Emulsion Exposure
Approval	27 Mar, 75	Emulsion Exposure
Completed	29 Dec, 76	1 Stack(s)

387 EMULSION/PI- @ 200 #387 — Richard J. Wilkes — UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - Miscellaneous
100 TO 300 GEV PION INTERACTIONS IN EMULSION AND HEAVY ELEMENT TARGETS.

Request	7 Mar, 75	Emulsion Exposure
Approval	13 May, 75	Emulsion Exposure
Completed	9 Jun, 75	4 Stack(s)

388 15-FOOT ANTI-NEUTRINO/H2&NE#388 — Vincent Z. Peterson — FERMILAB; UNIVERSITY OF HAWAII AT MANOA; LAWRENCE BERKELEY LABORATORY

BEAM: Neutrino Area - Dichromatic
PROPOSAL TO STUDY NEUTRAL CURRENT NEUTRINO AND ANTI-NEUTRINO INTERACTIONS IN THE 15-FOOT BUBBLE CHAMBER USING THE EXTERNAL MUON IDENTIFIER AND A DICHROMATIC BEAM.

Request	24 Apr, 75	200 K Pix
	7 Jun, 78	500 K Pix or 5 x 10 to the 18th protons
Approval	7 Jul, 75	200 K Pix of antineutrino bombardment with a heavy neon-hydrogen mixture contingent upon the construction and adequate performance of an improved narrow-band beam; see proposal #455
	24 Jun, 77	200 K Pix at higher energies using the D C Dichromatic train; new requests for use of the Dichromatic horn to be considered later
	28 Jun, 78	200 K Pix with a decision to maintain the approval as it stands
Completed	12 Sep, 79	181 K Pix

390 15-FOOT ANTI-NEUTRINO/D2 #390 — Arthur F. Garfinkel — ARGONNE NATIONAL LABORATORY; CARNEGIE-MELLON UNIVERSITY; PURDUE UNIVERSITY

BEAM: Neutrino Area - Wide Band Horn
ANTI-NEUTRINO INTERACTIONS IN THE DEUTERIUM-FILLED 15-FOOT BUBBLE CHAMBER.

Request	29 Apr, 75	300 K Pix
Approval	7 Jul, 75	300 K Pix
	28 Jun, 78	300 K Pix with a total of 150K pix presently scheduled for the experiment during the fall 1978 run
	19 Mar, 79	250 K Pix
Approved/Inactive	1 Apr, 79	10 K Pix as of 1 Apr 1979

391 MUON #391 — Leroy T. Kerth — UNIV. OF CALIFORNIA, BERKELEY; FERMILAB; LAWRENCE BERKELEY LABORATORY; PRINCETON UNIVERSITY

BEAM: Neutrino Area - Muon/Hadron Beam
EXPLORATION OF RARE MUON-INDUCED PROCESSES.

Request	15 Feb, 75	Unspecified
Approval	7 Jul, 75	Parasitic Running concurrent with exp# 203
Completed	18 May, 78	Unspecified but for information on the total extent of run, see exp #203A

395 HADRON JETS #395 — Walter Selove — LEHIGH UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M2 Beam
CALORIMETER-ARRAY STUDY OF HIGH P-TRANSVERSE EVENTS.

Request	21 May, 75	450 Hours total including 150 hours of tests
Approval	7 Jul, 75	450 Hours contingent upon the successful completion of the calorimeter tests planned for the M5 beam line
Completed	16 Nov, 77	1,150 Hours

396 HADRON DISSOCIATION #396 — Konstantin Goulianos — ROCKEFELLER UNIVERSITY

BEAM: Meson Area - M6 Beam
ELASTIC SCATTERING AND DIFFRACTION DISSOCIATION AT SMALL MOMENTUM TRANSFER FOR PI+-, K+-, P, PBAR AND N.

Request	21 May, 75	1,000 Hours
Approval	7 Jul, 75	600 Hours for Phase I
Completed	23 Nov, 77	1,200 Hours

397 PARTICLE SEARCH #397 — Jerome L. Rosen — FERMILAB, NORTHWESTERN UNIVERSITY, UNIVERSITY OF ROCHESTER, SLAC
BEAM: Meson Area - M3 Beam
PROPOSAL TO SEARCH FOR HIGH MASS PARTICLES PRODUCED IN ASSOCIATION WITH PROMPT MUONS.
(Using the spectrometer from exps #27A and #305 with additions.)

Request	21 May, 75	1,000 Hours
Approval	9 Jul, 75	500 Hours
	18 May, 76	1,000 Hours including an additional running period of approximately 5 weeks duration during the summer of 1976
Completed	18 Aug, 76	1,150 Hours

398 MUON #398 — Richard Wilson — UNIVERSITY OF CHICAGO, HARVARD UNIVERSITY, UNIVERSITY OF ILLINOIS, CHAMPAIGN, UNIVERSITY OF OXFORD (ENGLAND), VIRGINIA TECH
BEAM: Neutrino Area - Muon/Hadron Beam
A PROPOSAL FOR A FURTHER STUDY OF MUON NUCLEON INELASTIC SCATTERING AT FERMILAB.
(Using the spectrometer of exp #98.)

Request	21 May, 75	800 Hours
Approval	7 Jul, 75	800 Hours of H2 and D2 running with the expectation that some of this running can occur concurrently with exp #319, at which time priority will be given to exp# 319
Completed	1 Dec, 76	1,100 Hours

399 EMULSION/ELECTRONS @ >100 #399 — Robert L. Golden — JOHNSON SPACE CENTER (NASA), KANAGAWA UNIVERSITY (JAPAN), ISAS, TOKYO UNIVERSITY (JAPAN), UNIVERSITY OF WASHINGTON
BEAM: Proton Area - Miscellaneous
PRODUCTION OF ELECTROMAGNETIC CASCADE SHOWERS BY SEVERAL HUNDRED GEV ELECTRONS IN EMULSION CHAMBERS.

Request	5 May, 75	1,000 Emulsion Exposure
Approval	19 Jun, 75	Emulsion Exposure to electrons with fluxes of 10, 1,000, and 200K/sq cm
Completed	5 Oct, 76	6 Stack(s)

400 PARTICLE SEARCH #400 — James E. Wiss — UNIVERSITY OF BOLOGNA (ITALY), UNIVERSITY OF COLORADO AT BOULDER, FERMILAB, UNIVERSITY OF ILLINOIS, CHAMPAIGN, INFN, MILANO (ITALY), UNIVERSITY OF MILANO (ITALY), UNIVERSITY OF PAVIA (ITALY), YALE UNIVERSITY
BEAM: Proton Area - East
A SEARCH FOR NEW PARTICLES PRODUCED IN ASSOCIATION WITH THE HADRONIC PRODUCTION OF PSI (3.1) MESONS.
(Using a proton beam of about 10 to the 7th into the zero degree neutral beam line and the spectrometer of exp #401/458 with additions.)

Request	22 May, 75	870 Hours
Approval	7 Jul, 75	400 Hours
	2 Jul, 76	400 Hours with a total of 1,000 hours approved for the combination of exps #400, #401, and #458
	14 Mar, 77	400 Hours with a total of 2,000 hours for the combination of exps #400,401 & 458
	1 Apr, 78	Unspecified since approved running time has been used by exp #87A
	7 Jul, 80	500 Hours
Completed	14 Jul, 84	2,210 Hours

401 PHOTOPRODUCTION #401 — Michael F. Gormley — FERMILAB, UNIVERSITY OF ILLINOIS, CHAMPAIGN
BEAM: Proton Area - East
PHOTOPRODUCTION OF HIGH MASS TWO-BODY FINAL STATES.
(Using an improved exp #87A apparatus and an additional sweeping magnet in the photon beam.)

Request	22 May, 75	300 Hours
	1 Jun, 78	1,100 Hours
Approval	7 Jul, 75	300 Hours
	2 Jul, 76	300 Hours with a total of 1,000 hours approved for the combination of exps #400, #401, and #458
	14 Mar, 77	600 Hours with a total of 2,000 hours for the combination exps #400,401,&458
	1 Apr, 78	Unspecified since approved running time has been used by exp #87A
	29 Jun, 78	600 Hours
Completed	26 Nov, 79	2,100 Hours

404 INCLUSIVE NEUTRON #404 — H. Richard Gustafson — UNIVERSITY OF MICHIGAN - ANN ARBOR, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
INCLUSIVE NEUTRON PRODUCTION BY PROTONS ON PROTONS AND NUCLEI.

Request	22 May, 75	500 Hours
Approval	11 Mar, 76	Parasitic Running with the condition that there will be no significant interference with other work in the Meson Laboratory
Completed	5 Jul, 77	350 Hours

415 PARTICLE PRODUCTION #415 — Lee G. Pondrom — BROOKHAVEN NATIONAL LABORATORY, UNIVERSITY OF MICHIGAN - ANN ARBOR, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
MEASUREMENTS OF PI- CU TO K-SHORT, LAMBDA AND NEUTRON INCLUSIVE CROSS SECTIONS.
(For proposal #360 with the apparatus of exp #8 in the M2 beam line.)

Request	24 May, 75	100 Hours
Approval	28 Jun, 75	100 Hours
Completed	18 Oct, 76	100 Hours

416 PARTICLE SEARCH #416 — Henry J. Lubatti — UNIV. OF CALIFORNIA, DAVIS, LAL, ORSAY (FRANCE), UNIVERSITY OF WASHINGTON
BEAM: Meson Area - M1 Beam
STREAMER CHAMBER SEARCH FOR NEW STATES WHICH DECAY SEMI-LEPTONICALLY.
(Using the streamer chamber originally proposed for exp #86A with additional muon counters.)

Request	27 May, 75	300 Hours
Approval	29 May, 75	300 Hours with the understanding that the total running time for exp# 416 and exp# 86A is to remain within 800 hours
Completed	1 Jul, 75	400 Hours

418 PARTICLE PRODUCTION #418 — Felix Sannes — IMPERIAL COLLEGE (ENGLAND), UNIVERSITY OF ROCHESTER, RUTGERS UNIVERSITY
BEAM: Internal Target Area (C-0)
NUCLEAR SIZE DEPENDENCE FOR PARTICLE PRODUCTION AT INTERMEDIATE TRANSVERSE MOMENTUM.
(With the spectrometer used for exp #363.)

Request	2 Jun, 75	Unspecified
Approval	7 Jul, 75	500 Hours contingent upon the fact that such running does not constitute an interference with the requirements of other experiments to be run in that area
Completed	22 Oct, 75	900 Hours

419 EMULSION/PROTONS @ 300 #419 — Giorgio Giacomelli — UNIVERSITY OF BOLOGNA (ITALY)
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR SHORT LIVED PARTICLES PRODUCED BY 300 GEV PROTONS IN EMULSIONS.

Request	2 Jun, 75	Emulsion Exposure
Approval	10 Jun, 75	Emulsion Exposure
Completed	10 Jun, 75	1 Stack(s)

421 EMULSION/PROTONS @ 300 #421 — Venedict P. Dzhelepov — JINR, DUBNA (RUSSIA)
BEAM: Neutrino Area - Miscellaneous
EXPOSURE OF AN EMULSION CHAMBER TO A 300 GEV/C PROTON BEAM.

Request	18 Jun, 75	Emulsion Exposure
Approval	18 Jun, 75	Emulsion Exposure
Completed	24 Jun, 75	1 Stack(s)

423 EMULSION/PROTONS @ 400 #423 — Hisahiko Sugimoto — HIROSAKI UNIVERSITY (JAPAN); ICRR, UNIVERSITY OF TOKYO (JAPAN); UNIVERSITY OF TOKYO (JAPAN); WASEDA UNIVERSITY (JAPAN)
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR NEW PARTICLES IN EMULSION CHAMBERS.

Request	7 Jul, 75	Emulsion Exposure
Approval	21 Jul, 75	Emulsion Exposure
Completed	9 Dec, 75	4 Stack(s)

424 EMULSION/MUONS @ 200 #424 — Tomonori Wada — ASHIKAGA INST. OF TECH. (JAPAN); ICRR, UNIVERSITY OF TOKYO (JAPAN); OKAYAMA UNIVERSITY (JAPAN); SAITAMA UNIVERSITY (JAPAN)
BEAM: Neutrino Area - Miscellaneous
MULTIPLE PION PRODUCTION BY 200 GEV/C MUONS.

Request	23 Jun, 75	Emulsion Exposure
Approval	9 Feb, 76	Emulsion Exposure in the muon beam while it is operating for exp# 319 at a momentum in the vicinity of 300 GeV/c
Completed	8 Oct, 76	1 Stack(s)

425 K ZERO REGENERATION #425 — Valentine L. Telegdi — UNIV. OF CALIFORNIA, SAN DIEGO; UNIVERSITY OF CHICAGO; LHE, ETH HONGGERBERG (SWITZERLAND); SLAC; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M4 Beam
PROPOSAL TO INVESTIGATE REGENERATION OF NEUTRAL K-MESONS AT VERY HIGH ENERGIES.
(Using a liquid hydrogen target; see exp #82.)

Request	24 Jun, 75	600 Hours
Approval	18 Mar, 75	600 Hours contingent upon exp# 425 providing a hydrogen target (see exp# 82)
Completed	17 May, 76	1,400 Hours

426 FRAGMENTATION PARTICLES #426 — Katsura Fukui — HANSCOM A.F.B. GEOPHYSICS LAB.; UNIVERSITY OF KIEL (GERMANY)
BEAM: Meson Area - Miscellaneous
PROPOSAL ON THE STUDY OF FRAGMENTATION PARTICLES CREATED IN A PLASTIC DETECTOR BY 300 GEV PROTONS.

Request	27 May, 75	Detector Exposure
Approval	28 Jul, 75	Detector Exposure
Completed	20 Mar, 76	16 Stack(s)

427 DETECTOR DEVELOPMENT #427 — Luke C. L. Yuan — BROOKHAVEN NATIONAL LABORATORY
BEAM: Meson Area - M1 Beam
A PROPOSAL FOR TESTING A TRANSITION RADIATION DETECTOR AND A HIGH ENERGY SHOWER DETECTOR FOR COSMIC RAY EXPERIMENTS.

Request	27 Jun, 75	50 Hours
Approval	4 Jan, 78	100 Hours during an opportunity for running in the M1-beam in January 1978
Completed	10 Jan, 78	40 Hours with only a portion of the objectives of the experiment finished due to problems with the M1-beam and the accelerator

428 EMULSION/PROTONS @ 400 #428 — Jacques D. Hebert — UNIVERSITY OF BELGRADE(YUGOSLAVIA); CRN, STRASBOURG (FRANCE); FERMILAB; UNIVERSITY OF LUND (SWEDEN); UNIVERSITY OF LYON (FRANCE); UNIVERSITY OF NANCY (FRANCE); UNIVERSITY OF OTTAWA (CANADA); UNIV. OF PARIS VI, LPG (FRANCE); UNIVERSITY OF QUEBEC (CANADA); UNIVERSITY OF SANTANDER (SPAIN); UNIVERSITY OF VALENCIA (SPAIN); UNIV. OF WESTERN ONTARIO (CANADA)
BEAM: Neutrino Area - Miscellaneous
400 GEV PROTON INTERACTIONS IN NUCLEAR EMULSION.

Request	4 Aug, 75	Emulsion Exposure
Approval	25 Aug, 75	Emulsion Exposure
Completed	9 Dec, 75	14 Stack(s)

434 EMULSION/PROTONS @ 400 #434 — Shoji Dake — KOBE UNIVERSITY (JAPAN); KONAN UNIVERSITY (JAPAN); SAITAMA UNIVERSITY (JAPAN); UNIVERSITY OF TOKYO (JAPAN); UTSUNOMIYA UNIVERSITY (JAPAN)
BEAM: Neutrino Area - Miscellaneous
CASCADE SHOWERS ORIGINATED IN JET SHOWERS.

Request	16 Sep, 75	Emulsion Exposure
Approval	20 Sep, 75	Emulsion Exposure
Completed	9 Dec, 75	3 Stack(s)

435 MUON SEARCH #435 — Robert K. Adair — BROOKHAVEN NATIONAL LABORATORY; FERMILAB; YALE UNIVERSITY
BEAM: Proton Area - Center
MEASUREMENT OF THE POLARIZATION OF PROMPT MUONS AT X = 0.14 AT P-TRANSVERSE = 0 AND P-TRANSVERSE = 1.5 GEV/C.
(Extension of measurements begun in experiment #48.)

Request	18 Sep, 75	250 Hours total including 50 hours of tests
Approval	25 Nov, 75	250 Hours of setup and running time
Completed	2 Jul, 76	250 Hours

436 DI-MUON #436 — Robert K. Adair — BROOKHAVEN NATIONAL LABORATORY; FERMILAB; YALE UNIVERSITY
BEAM: Proton Area - Center
DETERMINATION OF THE POSSIBLE DI-MUON CHARACTER OF THE PROMPT MUON FLUX.

Request	18 Sep, 75	75 Hours including 40 hours of tests
Approval	7 Oct, 75	100 Hours to be completed during the operating period due to end in Nov. 1975
Completed	29 Oct, 75	200 Hours

438 NEUTRON-NUCLEUS INELASTIC #438 — Lawrence W. Jones — UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Meson Area - M3 Beam
INELASTIC CROSS SECTIONS OF NEUTRONS ON NUCLEI.

Request	26 Sep, 75	500 Hours
Approval	25 Nov, 75	200 Hours
Completed	18 Apr, 77	350 Hours

439 MULTI-MUON #439 — David A. Garelick — UNIVERSITY OF MICHIGAN - ANN ARBOR, NORTHEASTERN UNIVERSITY, TUFTS UNIVERSITY, UNIVERSITY OF WASHINGTON
BEAM: Meson Area - M2 Beam
HIGH SENSITIVITY SEARCH FOR NEW STATES WHICH DECAY INTO MUONS.

Request	26 Sep, 75	500 Hours	with 200 hours for tests and 300 hours for data
	31 May, 77	1,600 Hours	to include 3 additional one-month periods of running
Approval	25 Nov, 75	400 Hours	
	24 Jun, 77	800 Hours	with the understanding that the 400-hour extension and time remaining under previous approval be used for investigation of multi-muon events
	27 Jul, 77	800 Hours	with the previous constraints on the further running removed
	24 Mar, 78	1,600 Hours	with an extension until the spring 1978 shutdown, but without overriding priority
Completed	19 May, 78	1,700 Hours	

440 LAMBDA MAGNETIC MOMENT #440 — Gerry M. Bunce — UNIVERSITY OF MICHIGAN - ANN ARBOR, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
PROPOSAL FOR A NEW MEASUREMENT OF THE MAGNETIC MOMENT OF THE LAMBDA HYPERON.

Request	26 Sep, 75	160 Hours	
Approval	25 Nov, 75	160 Hours	
Completed	22 Mar, 77	250 Hours	

441 LAMBDA POLARIZATION #441 — Lee G. Pondrom — UNIVERSITY OF MICHIGAN - ANN ARBOR, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
A PROPOSAL TO STUDY LAMBDA POLARIZATION IN THE INCLUSIVE REACTION PROTON - PROTON TO LAMBDA PLUS ANYTHING WITH LIQUID HYDROGEN TARGET.
(Extension of previous measurements of 300 GeV protons on beryllium to 400 GeV protons on hydrogen.)

Request	29 Sep, 75	150 Hours	
Approval	25 Nov, 75	150 Hours	
Completed	2 Jul, 77	400 Hours	

442 NUCLEAR FRAGMENTS #442 — Frank Turkot — FERMILAB, PURDUE UNIVERSITY
BEAM: Internal Target Area (C-0)
STUDY OF NUCLEAR FRAGMENT EMISSION IN PROTON HEAVY NUCLEUS COLLISIONS FROM 10 TO 500 GEV.
(Will use room temperature gas jet target with heavy gases.)

Request	26 Sep, 75	400 Hours	for data taking
	11 May, 77	800 Hours	to include additional time to search for quarks bound in nuclear fragments
Approval	25 Nov, 75	400 Hours	
	25 Jun, 77	400 Hours	without time for the quark search
Completed	13 Aug, 77	1,200 Hours	

444 DI-MUON #444 — A. J. Stewart Smith — UNIVERSITY OF CHICAGO, PRINCETON UNIVERSITY
BEAM: Neutrino Area - Muon/Hadron Beam
A SPECIAL REQUEST FOR HIGH-PRIORITY RUNNING TO MEASURE HIGH-MASS MUON PAIRS.
(Using the Quadrupole Triplet focusing system for producing a high intensity hadron beam.)

Request	25 Sep, 75	400 Hours	
	31 May, 77	800 Hours	with a request for a 400 hour extension for a scaling test and to increase the sensitivity at high masses
Approval	24 Nov, 75	400 Hours	
	24 Jun, 77	400 Hours	with a decision not to grant an extension
Completed	3 Jan, 78	1,100 Hours	

448 MUON #448 — William A. Loomis — UNIVERSITY OF CHICAGO, FERMILAB, HARVARD UNIVERSITY, MASSACHUSETTS INST. OF TECHNOLOGY, MICHIGAN STATE UNIVERSITY, TUFTS UNIVERSITY
BEAM: Neutrino Area - Muon/Hadron Beam
PROPOSAL FOR THE INVESTIGATION OF VIRTUAL PHOTOABSORPTION BY NUCLEAR MATTER.
(Using the cyclotron spectrometer and heavy targets; see proposal #257.)

Request	17 Oct, 75	300 Hours	
	9 Jun, 77	300 Hours	to study both photoabsorption by nuclear matter and production of charmed particles (the latter to employ a Cerenkov counter)
Approval	15 Mar, 77	Parasitic	Running for about 300 hours concurrent with exp #203
	29 Jun, 77	Parasitic	Running for about 300 hours for study of photoabsorption of nuclear matter; without the disruption required to install the Cerenkov counter
Completed	7 May, 78	900 Hours	

451 INCLUSIVE SCATTERING #451 — Donald S. Barton — UNIVERSITY OF BARI (ITALY), BROWN UNIVERSITY, FERMILAB, MASSACHUSETTS INST. OF TECHNOLOGY, WARSAW HEP LABORATORY (POLAND)
BEAM: Meson Area - M6 Beam
STUDY OF THE A-DEPENDENCE OF INCLUSIVE PROCESSES AND ASSOCIATED MULTIPLICITY.
(Using the single arm spectrometer facility.)

Request	17 Oct, 75	600 Hours	including 100 hours of tests
Approval	30 Jun, 76	400 Hours	
Completed	6 Sep, 78	500 Hours	

456 FORM FACTOR #456 — Donald H. Stork — UNIV. OF CALIFORNIA, LOS ANGELES, FERMILAB, JINR, DUBNA (RUSSIA), NOTRE DAME UNIVERSITY, UNIVERSITY OF PITTSBURGH
BEAM: Meson Area - M1 Beam
MEASUREMENT OF THE KAON FORM FACTOR.
(Continuation of work begun in exp #216.)

Request	17 Oct, 75	800 Hours	including 200 hours of tests
Approval	25 Nov, 75	500 Hours	
	7 Dec, 76	950 Hours	including an additional 450 hours for data taking with a request for a report on preliminary results from existing data before the start of the next running period
Completed	13 Apr, 77	1,450 Hours	

458 PHOTOPRODUCTION #458 — Wonyong Lee — COLUMBIA UNIVERSITY, FERMILAB, UNIVERSITY OF ILLINOIS, CHAMPAIGN
BEAM: Proton Area - East
PHOTOPRODUCTION EXPERIMENT AT FERMILAB.
(Using the broad band photon beam; a continuation of work begun in exp #87A and #401.)

Request	17 Oct, 75	700 Hours	
	7 May, 76	900 Hours	with 300 hours for testing, 600 hours for data
Approval	2 Jul, 76	300 Hours	with a total of 1,000 hours approved for the comination of exps #400, #401, and #458
	14 Mar, 77	1,000 Hours	with a total of 2,000 hours for the combination of expts #400,401,&458
	1 Apr, 78	Unspecified	since approved running time has been used by exp #87a
Approved/Inactive	27 Oct, 81	Unspecified	

461 EMULSION/PROTONS @ 400 #461 — Jere J. Lord
UNIV. OF AUCKLAND (NEW ZEALAND)
AUSTRALIAN NAT'L. UNIV.(AUSTRALIA)
UNIVERSITY OF MELBOURNE(AUSTRALIA)
UNIVERSITY OF SYDNEY (AUSTRALIA)
UNIVERSITY OF TASMANIA (AUSTRALIA)
UNIVERSITY OF WASHINGTON

BEAM: Neutrino Area - Miscellaneous
SEARCH FOR NEW PARTICLES FROM 400 GEV PROTON COLLISIONS IN EMULSIONS.

Request	10 Nov, 75	Emulsion Exposure
Approval	26 Nov, 75	6 Stack(s)
Completed	9 Dec, 75	6 Stack(s)

462 EMULSION/PROTONS @ 400 #462 — Giorgio Giacomelli
UNIVERSITY OF BOLOGNA (ITALY)
UNIVERSITY OF FIRENZE (ITALY)

BEAM: Neutrino Area - Miscellaneous
SEARCH FOR SHORT LIVED PARTICLES PRODUCED BY 400 GEV PROTONS IN EMULSIONS.

Request	18 Nov, 75	Emulsion Exposure
Approval	26 Nov, 75	Emulsion Exposure
Completed	9 Dec, 75	1 Stack(s)

463 EMULSION/PROTONS @ 400 #463 — M. I. Tretjakova
KAZAKH STATE UNIV., (KAZAKHSTAN)
LEBEDEV PHYSICAL INST. (RUSSIA)
ITEP, MOSCOW (RUSSIA)
PNPI, ST. PETERSBURG (RUSSIA)
TASHKENT, PHY.TEC.INS (UZBEKISTAN)

BEAM: Neutrino Area - Miscellaneous
THE INTERACTIONS OF PROTONS IN NUCLEAR EMULSION AT 400 GEV/C (OR 500 GEV/C).

Request	17 Nov, 75	Emulsion Exposure
Approval	26 Nov, 75	Emulsion Exposure
Completed	9 Dec, 75	2 Stack(s)

466 NUCLEAR FRAGMENTS #466 — Norbert T. Porile
ARGONNE NATIONAL LABORATORY
UNIVERSITY OF CHICAGO
UNIV. OF ILLINOIS, CHICAGO CIRCLE
PURDUE UNIVERSITY

BEAM: Proton Area - Miscellaneous
A PROPOSAL FOR THE STUDY OF HIGH-ENERGY REACTION MECHANISMS BY THE MEASUREMENT OF THE ANGULAR AND ENERGY DISTRIBUTIONS OF NUCLEAR FRAGMENTS RECOILING FROM TARGETS BOMBARDED WITH 200-300 GEV PROTONS.

Request	9 Jan, 76	500 Hours
Approval	30 Mar, 76	500 Hours to be met on an essentially parasitic basis with the understanding that this work will not constitute an interference with the rest of the proton area program
Completed	15 Feb, 88	102 Targets Exposed

467 TEST MUON IRRADIATION #467 — Melvin Freedman
ARGONNE NATIONAL LABORATORY

BEAM: Neutrino Area - Miscellaneous
PROPOSAL FOR PARASITIC DUAL TARGET IRRADIATION WITH MUON SPILL BEAM BEHIND EXP #319.

Request	13 Jan, 76	Target Exposure(s)
Approval	28 Apr, 76	Parasitic Running for a bombardment of chlorine and thallium targets downstream of exp #319 or exp #398
Completed	1 Dec, 76	4 Targets Exposed

468 PARTICLE SEARCH #468 — Phillip H. Steinberg
UNIVERSITY OF MARYLAND

BEAM: Meson Area - M2 Beam
SEARCH FOR PENETRATING MASSIVE NEUTRAL PARTICLES PRODUCED IN HIGH ENERGY PROTON COLLISIONS.

Request	21 Jan, 76	1,200 Hours
	4 Oct, 76	300 Hours in a 400 GeV proton beam at an intensity of 10 to the 9th protons/pulse
	4 Nov, 77	450 Hours including an additional 150 hours to improve the sensitivity during another run of the experiment
Approval	18 Nov, 76	300 Hours
Completed	14 Aug, 77	300 Hours

469 PARTICLE SEARCH #469 — David Cutts
UNIVERSITY OF BARI (ITALY)
BROWN UNIVERSITY
CERN (SWITZERLAND)
FERMILAB
MASSACHUSETTS INST. OF TECHNOLOGY

BEAM: Meson Area - M6 Beam
SEARCH FOR HEAVY LONG-LIVED PARTICLES.
(Using the single arm spectrometer facility.)

Request	23 Jan, 76	150 Hours
Approval	3 Feb, 78	150 Hours with the understanding that the schedule for this run may place the desired running for exp #451 in some jeopardy
Completed	15 May, 78	400 Hours

472 PARTICLE SEARCH #472 — Kenneth C. Stanfield
FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR
PURDUE UNIVERSITY

BEAM: Meson Area - M2 Beam
SEARCH FOR HEAVY PARTICLES PRODUCED IN ASSOCIATION WITH PROMPT MUONS.
(Experiment would use modified exp #357 spectrometer.)

Request	23 Jan, 76	600 Hours including 100 hours of tests
Approval	10 Mar, 76	600 Hours
Completed	29 Nov, 76	1,100 Hours

481 EMULSION/PI- @ 300 #481 — Yoshiyuki Takahashi
OSAKA CITY UNIVERSITY (JAPAN)
SHINSHU UNIVERSITY (JAPAN)

BEAM: Neutrino Area - Miscellaneous
INVESTIGATION OF MULTIPLE PRODUCTION BY PI - MESONS WITH EMULSION CHAMBER.

Request	28 Apr, 76	Emulsion Exposure 10K particles per cm. sq. over a square of 10 cm x 10 cm
Approval	12 May, 76	Emulsion Exposure
Completed	18 Jan, 78	7 Stack(s)

482 NEUTRINO #482 — Barry C. Barish
CALIFORNIA INSTITUTE OF TECHNOLOGY
FERMILAB
NORTHWESTERN UNIVERSITY
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY

BEAM: Neutrino Area - Quadrupole Triplet
STUDY OF DI-MUON EVENTS PRODUCED IN NEUTRINO INTERACTIONS.

Request	11 May, 76	500 Hours to be run with the Quadrupole Triplet train load with focus set at 200 GeV at 10 to the 13th protons per pulse
Approval	30 Jun, 76	Parasitic Running with other experiments using the neutrino beam
Completed	3 Jan, 78	1,600 Hours

486	X ZERO CROSS SECTION #486	Bruce D. Winstein	UNIVERSITY OF CHICAGO
	BEAM: Meson Area - M4 Beam		LHE, ETH HONGGERBERG (SWITZERLAND)
	PROPOSAL TO STUDY THE ATOMIC NUMBER DEPENDENCE OF THE DIFFERENCE BETWEEN PARTICLE AND ANTI-PARTICLE TOTAL CROSS SECTIONS.		UNIVERSITY OF WISCONSIN - MADISON
	(Using the apparatus of exps #82 and #425 with modifications.)		
	Request 7 May, 76	200 Hours to be run in a modified version of the M-4 neutral beam; data taking to require 1.4 x 10 to the 17th protons into the meson production target	
	Approval 30 Jun, 76	200 Hours with a total of 800 hours approved for the combination of E-486 and E-226	
	Completed 17 Mar, 77	950 Hours	
490	PARTICLE SEARCH #490	Jack Sandweiss	FERMILAB
	BEAM: Meson Area - M1 Beam		LAWRENCE BERKELEY LABORATORY
	SEARCH FOR SHORT LIVED PARTICLES USING A HIGH RESOLUTION STREAMER CHAMBER.		YALE UNIVERSITY
	Request 7 May, 76	800 Hours to be run in a 200 GeV pi- beam of intensity 8 x 10 to the 5th particles per pulse focused to a 1 mm x 5 mm spot	
	Approval 30 Jun, 76	Test Running to study the performance of the high resolution streamer chamber	
	Completed 9 Jun, 80	850 Hours	
494	DI-HADRON #494	Myron L. Good	COLUMBIA UNIVERSITY
	BEAM: Proton Area - Center		FERMILAB
	A STUDY OF DI-HADRON PRODUCTION IN PROTON COLLISIONS AT FERMILAB.		SUNY AT STONY BROOK
	(This experiment is an off-shoot of di-lepton #288.)		
	Request 10 May, 76	800 Hours	
	Approval 17 May, 76	800 Hours	
	17 Nov, 76	1,400 Hours including an additional six weeks of running with the experiment expected to terminate in February 1977	
	Completed 21 Feb, 77	1,950 Hours	
495	XI-ZERO PRODUCTION #495	Kenneth J. Heller	BROOKHAVEN NATIONAL LABORATORY
	BEAM: Meson Area - M2 Beam		UNIVERSITY OF MICHIGAN - ANN ARBOR
	PROPOSAL TO STUDY CASCADE ZERO AND ANTILAMBDA PRODUCTION AND POLARIZATION.		RUTGERS UNIVERSITY
	(Experiment would use the spectrometer of E-8.)		UNIVERSITY OF WISCONSIN - MADISON
	Request 17 May, 76	400 Hours	
	Approval 17 Nov, 76	400 Hours	
	Completed 28 Aug, 78	700 Hours	
497	CHARGED HYPERON #497	Joseph Lach	FERMILAB
	BEAM: Proton Area - Center		IOWA STATE UNIVERSITY
	ELASTIC SCATTERING OF THE HYPERONS.		YALE UNIVERSITY
	(Measurements of charged hyperon fluxes and differential elastic cross sections, and a particle search.)		
	Request 13 May, 76	1,200 Hours with 600 hours for flux measurements and new particle search and 600 hours to measure differential cross sections	
	26 Jan, 79	800 Hours including an additional 400 hours to search for the b-particle after the beam is commissioned	
	Approval 29 Jun, 76	400 Hours initial approval	
	Completed 16 Mar, 81	2,500 Hours see proposal #697	
498	DETECTOR DEVELOPMENT #498	Charles R. Gruhn	LOS ALAMOS NATIONAL LABORATORY
	BEAM: Proton Area - East		
	A MEASUREMENT OF THE RELATIVISTIC RISE IN THE MOST PROBABLE ENERGY LOSS IN THIN SOLID FILMS.		
	Request 26 May, 76	50 Hours in an electron beam at the highest energies available	
	Approval 14 Jun, 76	Parasitic Running that will not disturb the normal proton area program	
	Completed 18 Aug, 76	50 Hours	
499	EMULSION/PROTONS @ 400 #499	Junsuke Iwai	WASEDA UNIVERSITY (JAPAN)
	BEAM: Neutrino Area - Miscellaneous		
	A STUDY OF ANGULAR DISTRIBUTIONS IN PROTON-NUCLEUS COLLISIONS USING NUCLEAR EMULSIONS.		
	Request 1 Jun, 76	2 Exposure(s)	
	Approval 16 Aug, 76	Emulsion Exposure with one stack exposed to an intensity of 600K protons/sq cm and a second to an intensity of 10K protons/sq cm	
	Completed 15 Jan, 78	5 Stack(s)	
501	TEST MUON IRRADIATION #501	Kenneth Lande	BROOKHAVEN NATIONAL LABORATORY
	BEAM: Neutrino Area - Muon/Hadron Beam		UNIVERSITY OF PENNSYLVANIA
	PROPOSAL FOR A MEASUREMENT OF THE TRANSITION RATE FOR CL(37) AND AR(37) INDUCED BY MUONS AT FERMILAB ENERGIES.		
	Request 11 Aug, 76	25 Hours an integrated flux of - about 5 x 10 to the 9th times (e/300) to the 0.7th - muons @ 75, 150, and 250 GeV	
	Approval 28 Oct, 76	Target Exposure(s) parasitic to running of upstream muon experiments	
	Completed 1 Dec, 76	2 Targets Exposed	
502	MONOPOLE #502	David F. Bartlett	UNIVERSITY OF COLORADO AT BOULDER
	BEAM: Neutrino Area - Miscellaneous		GENERAL ELECTRIC R&D CENTER
	SEARCH FOR MONOPOLES ABOVE THE 15-FOOT BUBBLE CHAMBER.		
	(Would require a scuttle in the roof of the 15-foot bubble chamber building.)		
	Request 30 Jul, 76	Cosmic Ray Running to include use of the fringe field of the 15-foot bubble chamber magnet during two long runs; approximately 7 months of data-taking requested with lexan and later with emulsion detectors	
	Approval 2 Sep, 76	Cosmic Ray Running during parasitic operation in the fringe field of the 15-foot bubble chamber magnet	
	Completed 23 Jun, 80	Cosmic Ray Running	
503	EMULSION/PI- @ 300 #503	Takeshi Ogata	HIROSAKI UNIVERSITY (JAPAN)
	BEAM: Neutrino Area - Miscellaneous		ICRR, UNIVERSITY OF TOKYO (JAPAN)
	MULTIPARTICLE PRODUCTION IN HIGH ENERGY PION-NUCLEUS INTERACTIONS.		KONAN UNIVERSITY (JAPAN)
			KWANSEI GAKUIN UNIVERSITY (JAPAN)
	Request 12 Aug, 76	Emulsion Exposure consisting of eight blocks of mulsion exposed to 50K particles/sq cm in a pi- beam of 200 GeV/c or greater	
	Approval 19 Aug, 76	Emulsion Exposure	
	Completed 18 Jan, 78	4 Stack(s)	

505 PROTON POLARIZATION #505 — Samuel Peter Yamin
BEAM: Meson Area - M2 Beam
A SEARCH FOR PROTON POLARIZATION IN INCLUSIVE PRODUCTION AT 300 GEV/C.
BROOKHAVEN NATIONAL LABORATORY
UNIVERSITY OF MICHIGAN - ANN ARBOR
RUTGERS UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON

Request	16 Aug, 76	100 Hours with a change in the targetting angle of the primary proton beam for the meson area
Approval	29 Jun, 78	100 Hours with low priority during the time available for exp #495
Completed	27 Aug, 78	50 Hours

506 EMULSION/PI- @ 300 #506 — Shoji Dake
BEAM: Neutrino Area - Miscellaneous
CASCADE SHOWERS ORIGINATED IN JET SHOWERS DUE TO NEGATIVE PIONS.
KOBE UNIVERSITY (JAPAN)
KONAN UNIVERSITY (JAPAN)
SAITAMA UNIVERSITY (JAPAN)
UNIVERSITY OF TOKYO (JAPAN)

Request	17 Aug, 76	Emulsion Exposure using two - three emulsion chambers 10 cm x 10 cm x 8 xm exposed to 10-100 particles/sq cm in a pi- beam of 200 GeV/c or greater
Approval	23 Aug, 76	Emulsion Exposure
Completed	15 Jan, 78	2 Stack(s)

507 HIGH ENERGY CHANNELING #507 — Edward N. Tsyganov
BEAM: Meson Area - M1 Beam
PROPOSAL TO STUDY CHANNELING AT FERMILAB.
(Using the spectrometer of exp #456.)
UNIV. OF CALIFORNIA, LOS ANGELES
FERMILAB
JINR, DUBNA (RUSSIA)
KHARKOV PHYS-TECH INST (UKRAINE)
LEHIGH UNIVERSITY
ITEP, MOSCOW (RUSSIA)
SUNY AT ALBANY
TOMSK POLYTECH. INST. (USSR)
INR, WARSAW (POLAND)

Request	8 Sep, 76	250 Hours use of the M-1 beam is requested in conjunction with operation of form factor #456
Approval	1 Jun, 77	250 Hours with the understanding that this activity will not delay significantly the program in the M1 beam
Completed	30 May, 77	350 Hours

508 EMULSION/PROTONS @ 500 #508 — Wladyslaw Wolter
BEAM: Meson Area - Test Beam
STUDY OF THE MECHANISM FOR MULTIPLE PRODUCTION OF PARTICLES AT HIGH ENERGIES.
INP, KRAKOW (POLAND)

Request	15 Sep, 76	Emulsion Exposure consisting of 3 emulsion stacks
Approval	24 Sep, 76	Emulsion Exposure
Completed	26 Apr, 85	7 Emulsion Stack(s)

509 EMULSION/MUONS @ 200 #509 — T. Shirai
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR THE LARGE ANGLE SCATTERING OF MUONS.
KANAGAWA UNIVERSITY (JAPAN)
KOBE UNIVERSITY (JAPAN)
UNIVERSITY OF TOKYO (JAPAN)

Request	13 Sep, 76	Emulsion Exposure of 10 to the 6th particles/sq cm
Approval	24 Sep, 76	Emulsion Exposure
Completed	8 Oct, 76	1 Stack(s)

510 EMULSION/ELECTRONS @ HI E #510 — Kiyoshi Niu
BEAM: Proton Area - Miscellaneous
STUDY OF CASCADE SHOWERS INITIATED BY ELECTRONS.
AICHI UNIV. OF EDUCATION (JAPAN)
NAGOYA UNIVERSITY (JAPAN)
YOKOHAMA NATIONAL UNIV. (JAPAN)

Request	9 Sep, 76	Emulsion Exposure
Approval	24 Sep, 76	Emulsion Exposure
Completed	5 Oct, 76	6 Stack(s)

515 PARTICLE SEARCH #515 — Jerome L. Rosen
BEAM: Meson Area - M1 Beam
PROPOSAL TO STUDY CHARGED PARTICLES PRODUCED IN HADRONIC INTERACTIONS.
CARNEGIE-MELLON UNIVERSITY
FERMILAB
NORTHWESTERN UNIVERSITY
NOTRE DAME UNIVERSITY

Request	5 Oct, 76	1,000 Hours in a high intensity pi- beam @ 200 GeV/c
Approval	14 Mar, 77	800 Hours
Completed	10 Mar, 82	2,650 Hours

516 PHOTOPRODUCTION #516 — E. Thomas Nash
BEAM: Proton Area - East
A STUDY OF PHOTOPRODUCTION USING A MAGNETIC SPECTROMETER AT THE TAGGED PHOTON LAB.
UNIV. OF CALIFORNIA, SANTA BARBARA
CARELTON UNIVERSITY (CANADA)
UNIVERSITY OF COLORADO AT BOULDER
FERMILAB
NATIONAL RESEARCH COUNCIL (CANADA)
UNIVERSITY OF OKLAHOMA
UNIVERSITY OF TORONTO (CANADA)

Request	5 Oct, 76	1,000 Hours in the tagged photon beam assuming a primary beam of 450 GeV protons with 2.9 x 10 to the 15th protons/hour
	3 Oct, 77	1,000 Hours with 6 x 10 to the 12th protons per pulse, a 1 sec. flattop and a 10 sec. cycle
Approval	15 Nov, 77	1,000 Hours to include 400 hours for testing and 600 hours for data
Completed	1 Jun, 81	4,500 Hours

522 PROTON POLARIZATION #522 — Harold O. Ogren
BEAM: Internal Target Area (C-0)
A STUDY OF INCLUSIVE PROTON POLARIZATION.
INDIANA UNIVERSITY

Request	28 Oct, 76	840 Hours the experiment would run with the existing exp #313 set-up in the internal target area
Approval	25 Jun, 77	800 Hours conditional on cryogenic operation of the internal target area
Completed	21 Mar, 78	700 Hours

524 EMULSION/PROTONS > 500 GEV #524 — Richard J. Wilkes
BEAM: Meson Area - Test Beam
PROPOSAL TO STUDY INTERACTIONS OF PROTONS OF ENERGY GREATER THAN 500 GEV IN EMULSION AND HEAVY NUCLEI.
UNIVERSITY OF WASHINGTON

Request	18 Jan, 77	Emulsion Exposure of 10 plates would be exposed to fluxes ranging from 75,000 to 200,000 particles/sq.cm.
Approval	3 Mar, 77	Emulsion Exposure with a momentum of approximately 500 GeV/c
Completed	26 Apr, 85	6 Emulsion Stack(s)

525 EMULSION/PI- @ 300 #525 — Richard J. Wilkes
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY PROTON-NUCLEUS INTERACTIONS IN EMULSION PLATES WITH EMBEDDED METAL POWDER GRANULES AT 300 GEV.
UNIVERSITY OF WASHINGTON

Request	18 Jan, 77	Emulsion Exposure of 10 plates would be exposed in a negative beam to fluxes ranging from 75,000 - 200,000 particles/sq.cm.
	13 Dec, 77	Emulsion Exposure with a request for the beam energy to be changed to 300 GeV
Approval	3 Mar, 77	Emulsion Exposure
Completed	15 Jan, 78	2 Stack(s)

531 NEUTRINO #531 — Neville W. Reay — AICHI UNIV. OF EDUCATION (JAPAN), FERMILAB, ICRR, UNIVERSITY OF TOKYO (JAPAN), KOBE UNIVERSITY (JAPAN), KOREA UNIVERSITY, SEOUL (KOREA), MCGILL UNIVERSITY (CANADA), NAGOYA UNIVERSITY (JAPAN), OHIO STATE UNIVERSITY, OKAYAMA UNIVERSITY (JAPAN), OSAKA CITY UNIVERSITY (JAPAN), OSAKA SCIENCE EDUC. INST. (JAPAN), UNIVERSITY OF OTTAWA (CANADA), UNIVERSITY OF TORONTO (CANADA), VIRGINIA TECH, YOKOHAMA NATIONAL UNIV. (JAPAN)

BEAM: Neutrino Area - Wide Band Horn
A PROPOSAL TO STUDY WEAK DECAY LIFETIMES OF NEUTRINO PRODUCED PARTICLES IN A TAGGED EMULSION SPECTROMETER.

Request	31 Jan, 77	1,500 Hours	or a total proton flux of 3 x 10 to the 18th
	19 May, 78	3,000 Hours	including a second parasitic run
	8 May, 79	2,250 Hours	total with an additional 1,100 hours requested for two runs of 6 x 10 to the 18th protons each, the first to be neutrinos (350 GeV pi+), the second to be antineutrinos (350 GeV pi- with the plug out)
Approval	15 Mar, 77	Parasitic Running	concurrent with other neutrino experiments
	1 Jul, 79	Parasitic Running	concurrent with the next 15-foot bubble chamber neutrino run with the Wide Band Horn
Completed	1 Jun, 81	3,800 Hours	

533 PI-MU ATOMS #533 — Gordon B. Thomson — UNIVERSITY OF CHICAGO, STANFORD UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M3 Beam
PROPOSAL TO MEASURE THE RATE OF FORMATION OF PI-MU ATOMS IN K-LONG M 3 DECAY.

Request	1 Feb, 77	500 Hours	based on 3 x 10 to the 6th K-longs/pulse in the M3 beam
Approval	18 Mar, 77	500 Hours	with the requirement that preliminary studies and tests show that costs for the experiment are reasonable
	19 Mar, 79	2,100 Hours	for the additional 1,500 hours requested for tuneup and data to complete the experiment
Completed	28 Nov, 79	2,050 Hours	

536 EMULSION/NEUTRINO #536 — Kiyoshi Niu — AICHI UNIV. OF EDUCATION (JAPAN), NAGOYA UNIVERSITY (JAPAN), YOKOHAMA NATIONAL UNIV. (JAPAN)

BEAM: Neutrino Area - Wide Band Horn
STUDY OF NEUTRINO INTERACTIONS IN NUCLEAR EMULSIONS.

Request	2 Feb, 77	500 Hours	or 1 x 10 to the 18th protons to be run in the broad band neutrino beam on a parasitic basis with the regular neutrino program
Approval	10 Feb, 77	Parasitic Running	
Completed	13 Aug, 77	2 Stack(s)	

537 DI-MUON #537 — Bradley B. Cox — UNIVERSITY OF ATHENS (GREECE), FERMILAB, MCGILL UNIVERSITY (CANADA), UNIVERSITY OF MICHIGAN - ANN ARBOR, SHANDONG UNIVERSITY (PRC)

BEAM: Proton Area - West
PROPOSAL TO STUDY PBAR-N INTERACTIONS IN THE P-WEST HIGH INTENSITY LABORATORY

Request	14 Feb, 77	1,700 Hours	with 300 hours of tuning and 600 hours initial data run to be followed by 800 hours for final data run, all in high intensity secondary beam
	31 Oct, 77	1,400 Hours	to include 100 hours of tuneup, 300 hours of pi- @ 200 or 300 GeV, 700 hours of pi+ @ 200 or 300 GeV and 300 hours of pbar @ 100 GeV
	31 Jan, 78	2,000 Hours	in high intensity secondary beam. Phase 1 would consist of 250 hours for tune up and 750 hours for data taking on di-muon production by p bars. Phase 2 would consist of 250 hours for tune up and 750 hours for data taking on di-electron production by p bars
Approval	16 Mar, 78	1,000 Hours	for study of di-muon production by pbars
Completed	28 Feb, 82	2,700 Hours	

540 PARTICLE SEARCH #540 — Michael J. Longo — UNIVERSITY OF MICHIGAN - ANN ARBOR

BEAM: Meson Area - M3 Beam
A SEARCH FOR NEW METASTABLE PARTICLES TRAPPED IN MATTER.

Request	22 Mar, 77	1,900 Hours	with a running period of six months in the M3 beam. The beam would be used 50 - 75% of the time available.
Approval	23 May, 77	Parasitic Running	conditional on negotiation of an agreement and that the experiment will be mounted and run under low priority conditions
Completed	21 Feb, 78	600 Hours	

545 15-FOOT NEUTRINO/D2&HIZ #545 — George A. Snow — ILLINOIS INSTITUTE OF TECHNOLOGY, UNIVERSITY OF MARYLAND, SUNY AT STONY BROOK, TOHOKU UNIVERSITY (JAPAN), TUFTS UNIVERSITY

BEAM: Neutrino Area - Wide Band Horn
PROPOSAL FOR AN EXTENSION OF E-151/E-227 TO STUDY NEUTRINO INTERACTIONS IN DEUTERIUM IN THE 15-FOOT BUBBLE CHAMBER WITH PLATES.
(An initial run will be without plates.)

Request	18 Apr, 77	300 K Pix	
	21 Dec, 77	500 K Pix	to be run in the wide band beam with 1.3 x 10 to the 13th protons per pulse incident on the target at 400 GeV
Approval	16 Mar, 78	350 K Pix	or equivalently 3.5 x 10 to the 18th protons; with the assumption that the test of the plate system will be successful
	28 Jun, 78	350 K Pix	to be run in the 15-ft chamber without plates
Completed	17 Jan, 79	317 K Pix	

546 15-FOOT NEUTRINO/H2&NE #546 — Fred Russell Huson — UNIV. OF CALIFORNIA, BERKELEY, FERMILAB, UNIVERSITY OF HAWAII AT MANOA, LAWRENCE BERKELEY LABORATORY, UNIVERSITY OF WASHINGTON, UNIVERSITY OF WISCONSIN - MADISON

BEAM: Neutrino Area - Quadrupole Triplet
HIGH ENERGY NEUTRINO AND ANTINEUTRINO INTERACTIONS IN THE 15-FOOT BUBBLE CHAMBER USING THE QUADRUPOLE TRIPLET TRAIN LOAD AND THE TWO-PLANE EMI.

Request	27 Apr, 77	250 K Pix	with specific interest in an exposure of 5 x 10 to the 18th protons
Approval	29 Jun, 77	Parasitic Running	concurrent with other neutrino running with the Quad Triplet train
Completed	26 Jan, 78	375 K Pix	

547 EMULSION/PROTONS @ 400 #547 — C. J. Jacquot — CRN, STRASBOURG (FRANCE), UNIVERSITY OF LYON (FRANCE), UNIVERSITY OF SANTANDER (SPAIN)

BEAM: Neutrino Area - Miscellaneous
ANGULAR CORRELATIONS STUDY IN PROTON-NUCLEI JETS AT 400-500 GEV USING EMULSION TELESCOPE TECHNIQUES.

Request	27 Apr, 77	Emulsion Exposure	in a 400-500 GeV proton beam with incoming flux of 5 x 10 to the 4th particles over a surface 5 x 5 cm sq.
Approval	14 Jun, 77	Emulsion Exposure	
Completed	15 Jan, 78	.24 Stack(s)	

549 QUARK #549 — Michael J. Longo — UNIVERSITY OF MICHIGAN - ANN ARBOR; STANFORD UNIVERSITY
BEAM: Neutrino Area - Miscellaneous
A SEARCH FOR FRACTIONAL CHARGES USING ACCELERATOR AND LOW TEMPERATURE TECHNIQUES.

Request	2 May, 77	Parasitic Running to expose at least 12 niobium spheres in the vicinity of a proton beam with intensities of > 1 x 10 to the 13th per pulse
Approval	16 May, 77	Parasitic Running contingent on the target being prepared and provided by the experimenters
Approved/Inactive	1 Oct, 78	1 Target Exposure(s) as of 1 Oct 1978

552 P-N SCATTERING #552 — Felix Sannes — IMPERIAL COLLEGE (ENGLAND); UNIVERSITY OF ROCHESTER; RUTGERS UNIVERSITY
BEAM: Internal Target Area (C-0)
A PROPOSAL TO STUDY P - P ELASTIC AND P - D COHERENT SCATTERING.

Request	6 May, 77	900 Hours
Approval	25 Jun, 77	800 Hours conditional on cryogenic operation of the Internal Target Area
Completed	9 Apr, 78	950 Hours

553 NEUTRINO #553 — Paul F. Shepard — CORNELL UNIVERSITY; UNIVERSITY OF LIBRE (BELGIUM); UNIVERSITY OF LUND (SWEDEN); UNIVERSITY OF OKLAHOMA; UNIVERSITY OF PADOVA (ITALY); UNIVERSITY OF PITTSBURGH; INFN, ROME (ITALY); UNIVERSITY OF SYDNEY (AUSTRALIA); UNIVERSITY OF TORINO (ITALY); YORK UNIVERSITY (CANADA)
BEAM: Neutrino Area - Wide Band Horn
A PROPOSAL TO SEARCH FOR SHORT-LIVED PARTICLES PRODUCED BY ANTINEUTRINOS AND NEUTRINOS
(Using a hybrid emulsion-visual detecter.)

Request	6 May, 77	2,000 Hours with a specific request for 4 x 10 to the 18th protons
	5 Mar, 79	2,500 Hours total with an additional 1,000 hours for a run of at least 7 x 10 to the 18th protons with the broad band beam tuned for neutrinos
Approval	24 Jun, 77	Parasitic Running conditional on review of detector tests
	16 Nov, 77	Parasitic Running conditional on review of detector tests in January 1978
	1 Jul, 79	Parasitic Running concurrent with the next 15-foot bubble chamber neutrino run with the Wide Band Horn
Completed	1 Apr, 80	1,500 Hours

555 NEUTRAL HYPERON #555 — Thomas J. Devlin — UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF MINNESOTA; RUTGERS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
A PROPOSAL TO STUDY CROSS SECTIONS AND POLARIZATION IN NEUTRAL STRANGE PARTICLE PRODUCTION AT HIGH TRANSVERSE MOMENTUM.
(Using the neutral hyperon beam and associated experimental apparatus.)

Request	6 May, 77	250 Hours for tuneup and data
	19 May, 78	530 Hours for tuning and data at intensities of 1 x 10 to the 11th per pulse
Approval	15 Nov, 78	450 Hours
Completed	17 Feb, 82	650 Hours

557 HADRON JETS #557 — Ernest I. Malamud — UNIVERSITY OF ARIZONA; CALIFORNIA INSTITUTE OF TECHNOLOGY; FERMILAB; FLORIDA STATE UNIVERSITY; GEORGE MASON UNIVERSITY; UNIV. OF ILLINOIS, CHICAGO CIRCLE; INDIANA UNIVERSITY; UNIVERSITY OF MARYLAND; IHEP, PROTVINO (SERPUKHOV)(RUSSIA); RUTGERS UNIVERSITY
BEAM: Meson Area - Test Beam
PROPOSAL TO STUDY HADRON JETS WITH THE CALORIMETER TRIGGERED MULTIPARTICLE SPECTROMETER.
(Continuation of work begun in exp #260.)

Request	9 May, 77	1,600 Hours for data with a suggested run plan as follows - 400 hours at 200 GeV, 800 hours with upgraded M6-beam at 300 GeV, and 400 hours at 400 GeV
Approval	24 Jun, 77	1,600 Hours conditional on a better understanding of beam requirements for the experiment after an upgrading of the M6 beam
Completed	14 Jul, 84	1,470 Hours

564 15-FOOT & EMULSION/NEUTRINO#564 — Louis Voyvodic — FERMILAB; ILLINOIS INSTITUTE OF TECHNOLOGY; JINR, DUBNA (RUSSIA); UNIVERSITY OF KANSAS; INP, KRAKOW (POLAND); ITEP, MOSCOW (RUSSIA); IHEP, PROTVINO (SERPUKHOV)(RUSSIA); INST.FOR NUCL. RESEARCH (BULGARIA); UNIVERSITY OF SYDNEY (AUSTRALIA); UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - Wide Band Horn
DIRECT DETECTION OF SHORT-LIVED PARTICLES FROM NEUTRINO INTERACTIONS IN NUCLEAR EMULSIONS INSIDE THE 15-FOOT BUBBLE CHAMBER.

Request	11 May, 77	1,500 Hours with a specific request for neutrinos from a total proton flux of 3 x 10 to the 18th; running is proposed during the 15-foot running period with a deuterium fill planned for the spring of 1978
	8 May, 79	1,100 Hours additional to be run parasitically in the 15-ft chamber. film from two auxiliary cameras is requested for the neutrino portion of the running
Approval	24 Jun, 77	Parasitic Running with the understanding that the experiment impose only a small impact on the 15-ft chamber operations
	1 Jul, 79	Parasitic Running with the understanding that the experiment impose only a small impact on the 15-ft chamber operations
Completed	9 Mar, 81	277 K Pix

565 30-INCH HYBRID #565 — Irwin A. Pless — BROWN UNIVERSITY; FERMILAB; COLLEGE DE FRANCE (FRANCE); INDIANA UNIVERSITY; MASSACHUSETTS INST. OF TECHNOLOGY; NIJMEGEN UNIVERSITY (NETHERLANDS); OAK RIDGE NATIONAL LABORATORY; RUTGERS UNIVERSITY; STEVENS INSTITUTE OF TECHNOLOGY; UNIVERSITY OF TEL-AVIV (ISRAEL); UNIVERSITY OF TENNESSEE, KNOXVILLE; TOHOKU GAKUIN UNIVERSITY (JAPAN); TOHOKU UNIVERSITY (JAPAN); YALE UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
A STUDY OF THE DETAILED CHARACTERISTICS OF HADRON-NUCLEUS COLLISIONS USING THE FERMILAB HYBRID SPECTROMETER.
(The experiment would be run with aluminum, silver, and gold foil targets mounted inside the 30-inch hydrogen-filled bubble chamber.)

Request	2 Jun, 77	3,000 K Pix in a 400 GeV proton beam (400 hours, 1,000K pix) and a 200 GeV proton plus pion beam (800 hours, 2,000K pix)
	7 Feb, 78	2,000 K Pix to be taken as follows- 500K pix with 200 GeV incident protons 500K pix with 200 GeV incident pi+ 800K pix with 200 GeV incident pi- 200K pix with 400 GeV incident protons
Approval	16 Mar, 78	Parasitic Running with exp #570
Completed	1 Jun, 82	1,068 K Pix total for E-565 and E-570

567 PARTICLE SEARCH #567 — Michael S. Witherell — BROOKHAVEN NATIONAL LABORATORY; CEN-SACLAY (FRANCE); FERMILAB; PRINCETON UNIVERSITY; UNIVERSITY OF TORINO (ITALY)
BEAM: Proton Area - West
SEARCH FOR CHARM PRODUCTION IN 200 GEV/C HADRON INTERACTIONS.
(Using the spectrometer for exp #302 with additions.)

Request	13 Jun, 77	500 Hours
Approval	24 Jun, 77	500 Hours with 100 hours for checkout and 400 hours for data-taking
Completed	7 Nov, 79	1,650 Hours see exp #650

568 EMULSION/PI- @ 300 #568 — Jacques D. Hebert — UNIVERSITY OF BELGRADE(YUGOSLAVIA); CRN, STRASBOURG (FRANCE); FERMILAB; UNIVERSITY OF LUND (SWEDEN); UNIVERSITY OF NANCY (FRANCE); UNIVERSITY OF OTTAWA (CANADA); UNIV. OF PARIS VI, LPG (FRANCE); LRC, LYON (FRANCE); UNIVERSITY OF SANTANDER (SPAIN); UNIVERSITY OF VALENCIA (SPAIN)
BEAM: Neutrino Area - Miscellaneous
300 GEV PION INTERACTIONS IN NUCLEAR EMULSION.

Request	8 Aug, 77	Emulsion Exposure of 3 stacks in a negative beam of about 30K particles per cm sq.
Approval	16 Sep, 77	Emulsion Exposure of 3 stacks in a 300 GeV negative beam with a flux of 30K particles per cm sq over an area of 3 x 3 cm sq
Completed	15 Jan, 78	3 Stack(s)

570 30-INCH HYBRID #570 — Irwin A. Pless — BROWN UNIVERSITY; FERMILAB; COLLEGE DE FRANCE (FRANCE); INDIANA UNIVERSITY; MASSACHUSETTS INST. OF TECHNOLOGY; NIJMEGEN UNIVERSITY (NETHERLANDS); OAK RIDGE NATIONAL LABORATORY; RUTGERS UNIVERSITY; STEVENS INSTITUTE OF TECHNOLOGY; UNIVERSITY OF TEL-AVIV (ISRAEL); UNIVERSITY OF TENNESSEE, KNOXVILLE; TOHOKU GAKUIN UNIVERSITY (JAPAN); TOHOKU UNIVERSITY (JAPAN); YALE UNIVERSITY
BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL FOR A STUDY OF PARTICLE PRODUCTION AND DYNAMICS FROM X = 0 TO X = 1 AND THE DEPENDENCE ON INCIDENT QUANTUM NUMBERS.
(Supercedes proposal #488. Will use the forward gamma detector and the downstream ISIS system with the 30-inch hybrid spectrometer.)

Request	16 Sep, 77	2,000 K Pix to be taken with the 30-inch hybrid spectrometer exposed to two beams, 1,000K pix in a positive beam with 10% K+ and equal fractions of protons and pi+, and 1,000K pix in a negative beam with 20% pbars
Approval	16 Mar, 78	1,500 Hours for a run of 15 weeks duration; combined with exp #565
Completed	1 Jun, 82	1,068 K Pix total for E-565 and E-570

573 EMULSION/PI- @ 300 #573 — Noriyuki Ushida — AICHI UNIV. OF EDUCATION (JAPAN); NAGOYA UNIVERSITY (JAPAN); YOKOHAMA NATIONAL UNIV. (JAPAN)
BEAM: Neutrino Area - Miscellaneous
A SEARCH FOR CHARMED PARTICLES PRODUCED BY 300 GEV/C NEGATIVE PIONS IN NUCLEAR EMULSION.

Request	29 Nov, 77	3 Stack(s) exposed in a negative pion beam to an integrated flux of 7.5 x 10 to the 3rd particles per cm sq
Approval	29 Nov, 77	3 Stack(s)
Completed	15 Jan, 78	3 Stack(s)

574 EMULSION/PI- @ 300 #574 — Wladyslaw Wolter — INP, KRAKOW (POLAND)
BEAM: Neutrino Area - Miscellaneous
A STUDY OF THE MECHANISM FOR MULTIPLE PRODUCTION OF PARTICLES AT OR ABOVE 300 GEV PION INTERACTIONS IN NUCLEAR EMULSION.

Request	1 Dec, 77	3 Stack(s) exposed in a 300 GeV negative pion beam to an integrated intensity of 5 x 10 to the 4th particles per cm sq
Approval	1 Dec, 77	3 Stack(s)
Completed	18 Jan, 78	4 Stack(s)

575 EMULSION/PROTONS @ 400 #575 — Jere J. Lord — UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY 400 GEV PROTON INTERACTIONS IN NUCLEAR EMULSION.

Request	13 Dec, 77	2 Stack(s) to be exposed in a 400 GeV proton beam focused to a diameter of less than 5-10 mm. One stack to receive a total dose of 100K p/cm sq and the other 200K p/cm sq.
Approval	13 Dec, 77	2 Stack(s)
Completed	15 Jan, 78	2 Stack(s)

576 EMULSION/PROTONS @ 500 #576 — Jacques D. Hebert — UNIVERSITY OF BELGRADE(YUGOSLAVIA); CRN, STRASBOURG (FRANCE); FERMILAB; UNIVERSITY OF LUND (SWEDEN); UNIVERSITY OF LYON (FRANCE); UNIVERSITY OF NANCY (FRANCE); UNIVERSITY OF OTTAWA (CANADA); UNIV. OF PARIS VI, LPG (FRANCE); UNIVERSITY OF SANTANDER (SPAIN); UNIVERSITY OF VALENCIA (SPAIN)
BEAM: Neutrino Area - Miscellaneous
500 GEV PROTON INTERACTIONS IN NUCLEAR EMULSION

Request	21 Dec, 77	Emulsion Exposure exposed in a 500 GeV proton beam to a total integrated flux of 3 x 10 to the 4th particles per cm sq
Approval	20 Feb, 78	Emulsion Exposure
Completed	11 Jul, 85	1 Emulsion Stack(s)

577 ELASTIC SCATTERING #577 — Roy Rubinstein — UNIVERSITY OF ARIZONA; UNIV. OF CALIFORNIA, SAN DIEGO; CORNELL UNIVERSITY; FERMILAB
BEAM: Meson Area - M6 Beam
PROPOSAL TO MEASURE PI P ELASTIC SCATTERING AT LARGE ANGLES.

Request	30 Jan, 78	1,000 Hours to be run in a 200 GeV incident beam with a beam flux between 5 x 10 to the 7th and 5 x 10 to the 8th pions per pulse
Approval	29 Jun, 78	1,000 Hours
Completed	16 Mar, 81	1,550 Hours

580 PARTICLE SEARCH #580 — Daniel R. Green — UNIVERSITY OF ARIZONA, FERMILAB, FLORIDA STATE UNIVERSITY, NOTRE DAME UNIVERSITY, TUFTS UNIVERSITY, VANDERBILT UNIVERSITY, VIRGINIA TECH

BEAM: Meson Area - M6 Beam
A SEARCH FOR NARROW AND BROAD RESONANCES DECAYING INTO LAMBDA-LAMBDA BAR, LAMBDA-LAMBDA BAR-PI, K SHORT AND K SHORT-K SHORT-PI FROM PI- P INTERACTIONS AT 300 GEV USING THE FERMILAB MPS.

Request	31 Jan, 78	800 Hours	to be run in a pion beam with an incident flux of 1.5 x 10 to the 6th pions per pulse at 300 GeV
Approval	29 Jun, 78	800 Hours	
Completed	1 Jun, 81	800 Hours	

581 POLARIZED SCATTERING #581 — Akihiko Yokosawa — ARGONNE NATIONAL LABORATORY, CEN-SACLAY (FRANCE), FERMILAB, HIROSHIMA UNIVERSITY (JAPAN), UNIVERSITY OF IOWA, KYOTO SANGYO UNIVERSITY (JAPAN), KYOTO UNIVERSITY (JAPAN), KYOTO UNIV. OF EDUCATION (JAPAN), LAPP, D'ANNECY-LE-VIEUX (FRANCE), LOS ALAMOS NATIONAL LABORATORY, NORTHWESTERN UNIVERSITY, UN. OF OCCUP. & ENV. HEALTH(JAPAN), IHEP, PROTVINO (SERPUKHOV)(RUSSIA), RICE UNIVERSITY, UNIVERSITY DI TRIESTE (ITALY), UNIVERSITY OF UDINE (ITALY)

BEAM: Meson Area - Polarized Proton Beam
CONSTRUCTION OF A POLARIZED BEAM FACILITY IN THE MESON LABORATORY AND EXPERIMENTS USING SUCH A FACILITY.
(Using the M2-beam converted to a polarized proton/antiproton beam.)

Request	31 Jan, 78	1,200 Hours	to include- 600 hours for total cross section difference measurements; 600 hours for asymmetry measurements in inclusive pion production
	30 Jan, 79	1,670 Hours	to include- 200 hours for beam measurements; 1,000 hours for high p-transverse physics; 220 hours for cross section measurements; 250 hours for hadron production at large-x
Approval	27 Nov, 79	Unspecified	approval for the construction of a polarized beam only
Approved/Inactive	10 Feb, 84	Unspecified	There is no approval yet for any experiment to use the beam.

584 PARTICLE SEARCH #584 — Bruce D. Winstein — UNIVERSITY OF CHICAGO, STANFORD UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M3 Beam
PROPOSAL TO SEARCH FOR THE DECAY OF NEW LONG-LIVED NEUTRAL PARTICLES WITH A MASS AND LIFETIME EXCEEDING THAT OF THE K LONG.

Request	31 Jan, 78	300 Hours	to be run in the M3 beam as modified for experiment #533
Approval	29 Jun, 78	300 Hours	with low priority
Completed	22 Jan, 80	400 Hours	

585 KAON CHARGE EXCHANGE #585 — William R. Francis — UNIV. OF CALIFORNIA, DAVIS; UNIV. OF CALIFORNIA, SAN DIEGO; CARELTON UNIVERSITY (CANADA); MICHIGAN STATE UNIVERSITY

BEAM: Meson Area - M4 Beam
A PROPOSAL TO STUDY EXCLUSIVE KN CHARGE EXCHANGE AT FERMILAB.
(The spectrometer from experiment #383 would be used.)

Request	31 Jan, 78	600 Hours	to be run immediately following the conclusion of exp #383
	13 Nov, 78	2,700 Hours	for 7 weeks of data to finish K- running and 9 weeks to repeat the experiment with a K+ beam and a deuterium target
Approval	16 Mar, 78	600 Hours	with conditions before the Meson Laboratory pause
	21 Dec, 78	1,800 Hours	with the approval of an additional 7 weeks of running to finish K- data; no commitment is made to K+ running
Completed	16 Mar, 81	3,150 Hours	

591 PARTICLE SEARCH #591 — Laszlo J. Gutay — FERMILAB, PURDUE UNIVERSITY

BEAM: Internal Target Area (C-0)
BROAD SEARCH FOR NEW HADRONIC STATES VIA HIGH RESOLUTION CHARGE AND MASS DETERMINATION OF NUCLEAR FRAGMENTS.

Request	31 Jan, 78	800 Hours	to include 200 hours for setup and 600 hours for data
Approval	21 Apr, 78	800 Hours	
Completed	8 Feb, 81	1,950 Hours	

592 NUCLEAR SCALING #592 — Sherman Frankel — ITEP, MOSCOW (RUSSIA); UNIVERSITY OF PENNSYLVANIA; COLLEGE OF WILLIAM AND MARY

BEAM: Proton Area - West
PROPOSAL FOR EXPERIMENTAL STUDY OF THE RELATIONSHIP BETWEEN HADRONIC AND NUCLEAR SCALING AT VERY HIGH ENERGIES.

Request	31 Jan, 78	300 Hours	to be run in a 400 GeV proton beam at an upstream location in P-West
Approval	17 Mar, 78	300 Hours	to be run in such a manner as not to interfere with the installation of the P-West pion beam
Completed	17 Jul, 78	500 Hours	

594 NEUTRINO #594 — James K. Walker — FERMILAB, ILLINOIS INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INST. OF TECHNOLOGY, MICHIGAN STATE UNIVERSITY, NORTHERN ILLINOIS UNIVERSITY

BEAM: Neutrino Area - Dichromatic
PROPOSAL FOR A NEW NEUTRINO DETECTOR AT FERMILAB.

Request	1 Feb, 78	2,500 Hours	for data to include: Experiment A (a study of semi-leptonic neutral current reactions) to require 6 x 10 to the 18th protons utilizing the narrow band beam at 250 GeV; Experiment B (neutrino electron elastic scattering) to require 6 x 10 to the 18th protons utilizing the two-horn beam
Approval	16 Mar, 78	Unspecified	
Completed	14 Jun, 82	4,400 Hours	

595 PARTICLE SEARCH #595 — Arie Bodek — CALIFORNIA INSTITUTE OF TECHNOLOGY, UNIVERSITY OF CHICAGO, FERMILAB, UNIVERSITY OF ROCHESTER, STANFORD UNIVERSITY

BEAM: Neutrino Area - 15 ft. Hadron Beam
A STUDY OF CHARM AND OTHER NEW FLAVORS PRODUCED IN PION-NUCLEON COLLISIONS.
(Continuation of work begun in exp #379.)

Request	1 Feb, 78	1,000 Hours	to include 400 hours at 300 GeV with an incident intensity of 10 to the 5th pi- per pulse and 400 hours at 250-300 GeV with incident intensity of 10 to the 6th pi- per pulse
Approval	29 Jun, 78	600 Hours	for the low-pt part of the experiment
Completed	16 Jun, 80	1,450 Hours	

596 PARTICLE SEARCH #596 — Leon M. Lederman
COLUMBIA UNIVERSITY
FERMILAB
SUNY AT STONY BROOK

BEAM: Neutrino Area - Muon/Hadron Beam
ON SEARCHING FOR HEAVY STABLE PARTICLES
(A continuation of work begun with exp #187.)

Request	3 Feb, 78	150 Hours	to be run with the beam tuned to 75 GeV and assuming 10 to the 13th primary protons incident per pulse
Approval	1 May, 78	150 Hours	
Completed	21 May, 78	200 Hours	

597 30-INCH HYBRID #597 — James J. Whitmore
UNIVERSITY OF CAMBRIDGE (ENGLAND)
DUKE UNIVERSITY
FERMILAB
UNIVERSITY OF KANSAS
MICHIGAN STATE UNIVERSITY
NOTRE DAME UNIVERSITY

BEAM: Neutrino Area - 30 in. Hadron Beam
PROPOSAL FOR A HIGH STATISTICS STUDY OF PBAR-P ANNIHILATIONS AND A COMPARISON OF PBAR, P, PI+-, AND K+ INTERACTIONS ON HYDROGEN, MAGNESIUM, AND GOLD AT 100 GEV/C UTILIZING THE FERMILAB 30-INCH HYDROGEN BUBBLE CHAMBER.
(The use of thin metallic foil targets in the hydrogen is requested.)

Request	3 Feb, 78	1,450 K Pix	to be taken as follows- 1,000K pix in negative beam @ 100 GeV 400K pix in positive beam @ 100 GeV 50K pix in negative beam @ 360 GeV
Approval	16 Mar, 78	1,000 Hours	for a run of 10 weeks duration
Completed	3 May, 82	658 K Pix	

605 HIGH MASS PAIRS #605 — John P. Rutherfoord
CEN-SACLAY (FRANCE)
CERN (SWITZERLAND)
COLUMBIA UNIVERSITY
FERMILAB
KEK (JAPAN)
KYOTO UNIVERSITY (JAPAN)
SUNY AT STONY BROOK
UNIVERSITY OF WASHINGTON

BEAM: Meson Area - East
A STUDY OF LEPTONS AND HADRONS NEAR THE KINEMATIC LIMITS.
(Using an apparatus with higher luminosity and acceptance than experiment #288.)

Request	9 May, 78	4,000 Hours	to be run with an incident intensity greater than 10 to the 13th protons/pulse at an energy of at least 400 GeV
	28 Nov, 78	4,000 Hours	in the Phase I configuration. an incident beam of 400 GeV protons would be needed with an intensity of 3 x 10 to the 12th per pulse
Approval	19 Mar, 79	1,000 Hours	with the Phase I detector
Completed	29 Aug, 85	3,970 Hours	

608 PARTICLE SEARCH #608 — Charles N. Brown
COLUMBIA UNIVERSITY
FERMILAB
SUNY AT STONY BROOK

BEAM: Proton Area - Center
A SEARCH FOR THE ETA SUB C IN HADRONIC INTERACTIONS.
(Using the spectrometer from exp #288/494.)

Request	28 Sep, 78	100 Hours	in the P-center proton beam at an incident intensity of 3 x 10 to the 9th protons per pulse
Approval	25 Jan, 79	Parasitic Running	
Completed	7 Mar, 79	600 Hours	

609 HADRON JETS #609 — Walter Selove
ARGONNE NATIONAL LABORATORY
FERMILAB
LEHIGH UNIVERSITY
UNIVERSITY OF PENNSYLVANIA
RICE UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M6 Beam
A STUDY OF THE STRUCTURE OF HIGH P TRANSVERSE HADRONIC INTERACTIONS.
(This proposal supersedes P-246.)

Request	2 Oct, 78	1,500 Hours	for Phase 1 to be run in a beam with 400 GeV capability with at least 10 to the 8th protons per sec incident Phase 2 would include addition of a large aperture magnet, Cerenkov imaging device and PWC's; Phase 3 would include a request for a higher energy beam
Approval	16 Nov, 78	Unspecified	with conditions
	30 Jan, 80	1,500 Hours	
Completed	14 Feb, 84	620 Hours	

610 PARTICLE SEARCH #610 — Thomas B. W. Kirk
FERMILAB
HOWARD UNIVERSITY
UNIVERSITY OF ILLINOIS, CHAMPAIGN
UNIVERSITY OF PENNSYLVANIA
PURDUE UNIVERSITY
TUFTS UNIVERSITY

BEAM: Neutrino Area - Muon/Hadron Beam
PION PRODUCTION OF HEAVY QUARK MESON STATES DECAYING INTO THE PSI/J (3097).
(Continuation of work begun in exp #369 but with upgraded cyclotron spectrometer.)

Request	2 Oct, 78	1,000 Hours	to be run with an incident intensity of 10 to the 13th protons per pulse on the production target
Approval	21 Dec, 78	1,000 Hours	with a schedule yet to be formally determined
Completed	23 Jun, 80	1,250 Hours	see proposal #673

612 PHOTON DISSOCIATION #612 — Konstantin Goulianos
ROCKEFELLER UNIVERSITY

BEAM: Proton Area - East
A PROPOSAL TO MEASURE THE DIFFRACTIVE PHOTON DISSOCIATION ON HYDROGEN.

Request	2 Oct, 78	1,150 Hours	to be run in the tagged photon beam with 10 to the 6th incident photons per pulse
Approval	15 Nov, 78	1,150 Hours	
Completed	12 Apr, 82	1,850 Hours	

613 BEAM DUMP #613 — Byron P. Roe
UNIVERSITY OF FIRENZE (ITALY)
UNIVERSITY OF MICHIGAN - ANN ARBOR
OHIO STATE UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON

BEAM: Meson Area - M2 Beam
PROPOSAL FOR A PROMPT NEUTRINO EXPERIMENT AT FERMILAB.

Request	2 Oct, 78	1,000 Hours	to obtain an exposure of 1 - 2 x 10 to the 17th protons with an incident intensity of 1 x 10 to the 12th protons/pulse
Approval	15 Nov, 78	1,000 Hours	with an expected reassessment of physics priorities and possible implications for this experiment in the fall of 1979
Completed	13 May, 82	1,800 Hours	

615 FORWARD SEARCH #615 — Kirk T. McDonald
UNIVERSITY OF CHICAGO
FERMILAB
IOWA STATE UNIVERSITY
PRINCETON UNIVERSITY

BEAM: Proton Area - West
A STUDY OF THE FORWARD PRODUCTION OF MASSIVE PARTICLES. IN PHASE ONE THE FORWARD PRODUCTION OF MUON PAIRS WOULD BE STUDIED.
(Using a forward spectrometer with mass selection.)

Request	28 Nov, 78	1,000 Hours	to be run in a 50-GeV pion beam at an incident intensity of 10 to the 10th pions per pulse
	7 May, 79	1,000 Hours	to include 600 hours of running with 250 GeV pions and 200 hours with 75 GeV pions. A primary proton intensity of 10 to the 13th per pulse on the P-West production target and 300 pulses per hour are assumed.
Approval	1 Jul, 79	1,000 Hours	
Completed	14 Jul, 84	2,260 Hours	

616 NEUTRINO #616 — Frank J. Sciulli — CALIFORNIA INSTITUTE OF TECHNOLOGY, COLUMBIA UNIVERSITY, FERMILAB, UNIVERSITY OF ROCHESTER, ROCKEFELLER UNIVERSITY
BEAM: Neutrino Area - Dichromatic
PROPOSAL TO MEASURE NEUTRINO STRUCTURE FUNCTIONS.
(Use of the Lab E neutrino detector to continue work begun in exp #356.)

Request	29 Jan, 79	3,200 Hours	to include specifically 600 hours for checkout, calibration and background studies, and 2 x 10 to the 19th protons at 400 GeV for data
Approval	19 Mar, 79	4,000 Hours	approximately or 2 x 10 to the 19th protons to be combined with running for exp #356
Completed	22 Jan, 80	2,900 Hours	

617 CP VIOLATION #617 — Bruce D. Winstein — CEN-SACLAY (FRANCE), UNIVERSITY OF CHICAGO
BEAM: Meson Area - M3 Beam
A STUDY OF DIRECT CP VIOLATION IN THE DECAY OF THE NEUTRAL KAON VIA A PRECISION MEASUREMENT OF THE RATIO OF ETA 00 TO ETA +-.

Request	30 Jan, 79	1,000 Hours	for data
Approval	19 Mar, 79	1,000 Hours	
Completed	14 Jun, 82	2,300 Hours	

619 TRANSITION MAGNETIC MOMENT #619 — Thomas J. Devlin — UNIVERSITY OF MICHIGAN - ANN ARBOR, UNIVERSITY OF MINNESOTA, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Proton Area - Center
A MEASUREMENT OF THE SIGMA-ZERO TO LAMBDA TRANSITION MAGNETIC MOMENT.

Request	7 May, 79	250 Hours	to be run in the diffracted proton beam (normally 400 GeV) at an intensity between 10 to the 8th and 10 to the 9th protons per pulse with a 1-sec spill
Approval	1 Jul, 79	250 Hours	
Completed	14 Jun, 82	675 Hours	

620 CHARGED HYPERON MAG MOMENT #620 — Lee G. Pondrom — UNIVERSITY OF MICHIGAN - ANN ARBOR, UNIVERSITY OF MINNESOTA, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
PROPOSAL TO MEASURE THE MAGNETIC MOMENTS OF THE SIGMA +, SIGMA -, XI -, AND OMEGA - HYPERONS USING THE FERMILAB NEUTRAL HYPERON BEAM.

Request	7 May, 79	300 Hours	to be run in the diffracted proton beam (350 to 400 GeV) at an intensity of 10 to the 9th protons per pulse and a 1-sec spill
Approval	1 Jul, 79	300 Hours	
Completed	22 Jan, 80	900 Hours	

621 CP VIOLATION #621 — Gordon B. Thomson — UNIVERSITY OF MICHIGAN - ANN ARBOR, UNIVERSITY OF MINNESOTA, RUTGERS UNIVERSITY
BEAM: Proton Area - Center
A MEASUREMENT OF THE CP VIOLATION PARAMETER ETA +-0.
(Use of the neutral hyperon spectrometer is assumed.)

Request	7 May, 79	1,200 Hours	to be run in 2 phases consisting of 200 hours for Phase 1 with some modifications to the present apparatus 1000 hours for Phase 2 at a later date after results from Phase 1 have been analyzed
Approval	1 Jul, 81	Unspecified	
Completed	29 Aug, 85	2,470 Hours	

622 QUARK #622 — H. Richard Gustafson — UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Meson Area - M2 Beam
PROPOSAL TO SEARCH FOR FRACTIONAL CHARGE PARTICLES FROM A MAGNETIZED BEAM DUMP.

Request	7 May, 79	100 Hours	to be run partially in conjunction with exp #361 using the beam dump from that experiment
Approval	1 Jul, 79	Parasitic	Running in a mode that is not to interfere with the operation of exp #361
Completed	23 Jun, 80	Unspecified	

623 PARTICLE SEARCH #623 — Daniel R. Green — UNIVERSITY OF ARIZONA, FERMILAB, FLORIDA STATE UNIVERSITY, NOTRE DAME UNIVERSITY, TUFTS UNIVERSITY, VANDERBILT UNIVERSITY, VIRGINIA TECH
BEAM: Meson Area - M6 Beam
PROPOSAL TO STUDY HIGH MASS STATES DECAYING INTO PHI-PI AND PHI-PHI PAIRS PRODUCED CENTRALLY IN 300 GEV/C PI MINUS PROTON INTERACTIONS.
(Use of the Fermilab multiparticle spectrometer facility is assumed.)

Request	7 May, 79	1,000 Hours	to be run in a 300 GeV/c beam of negative pions at an intensity of a few times 10 to the 6th pions per pulse
Approval	14 Nov, 80	500 Hours	to be run before 1983
Completed	14 Jun, 82	425 Hours	

629 DIRECT PHOTON PRODUCTION #629 — Charles A. Nelson, Jr. — FERMILAB, MICHIGAN STATE UNIVERSITY, UNIVERSITY OF MINNESOTA, NORTHEASTERN UNIVERSITY, UNIVERSITY OF ROCHESTER, TEXAS A&M UNIVERSITY
BEAM: Meson Area - M1 Beam
DIRECT PHOTON PRODUCTION IN HADRON NUCLEUS COLLISIONS.

Request	25 Feb, 80	600 Hours	to include 200 hrs for set up, 400 hrs for data
Approval	7 Jul, 80	Unspecified	approved as a test in the M-1 beam line in the fall of 1980
Completed	9 Mar, 81	600 Hours	

630 CHARM PARTICLE #630 — Jack Sandweiss — FERMILAB, LAWRENCE BERKELEY LABORATORY, YALE UNIVERSITY
BEAM: Proton Area - Center
STUDY OF B PARTICLE AND CHARMED PARTICLE PRODUCTION AND DECAY USING A HIGH RESOLUTION STREAMER CHAMBER.

Request	26 Feb, 80	600 Hours	
Approval	15 Mar, 80	600 Hours	
Completed	15 Mar, 82	1,150 Hours	

631 NUC CALIBRATION CROSS SECT #631 — Samuel I. Baker — BROOKHAVEN NATIONAL LABORATORY, CERN (SWITZERLAND), FERMILAB
BEAM: Neutrino Area - Miscellaneous
A MEASUREMENT OF NUCLEAR CALIBRATION CROSS SECTIONS FOR PROTONS BETWEEN 100 AND 1000 GEV.

Request	26 Feb, 80	25 Exposure(s)	
Approval	15 Dec, 80	Unspecified	in neutrino area
Completed	1 Jun, 81	41 Exposure(s)	

632 15-FT NEUTRINO/H2 & NE #632 — Douglas R. O. Morrison and Michael W. Peters — UNIVERSITY OF BIRMINGHAM (ENGLAND); UNIV. OF CALIFORNIA, BERKELEY; CEN-SACLAY (FRANCE); CERN (SWITZERLAND); FERMILAB; UNIVERSITY OF HAWAII AT MANOA; ILLINOIS INSTITUTE OF TECHNOLOGY; IMPERIAL COLLEGE (ENGLAND); JAMMU UNIVERSITY (INDIA); UNIVERSITY OF LIBRE (BELGIUM); MAX-PLANCK INSTITUTE (GERMANY); MOSCOW STATE UNIVERSITY (RUSSIA); ITEP, MOSCOW (RUSSIA); UNIVERSITY OF OXFORD (ENGLAND); PANJAB UNIVERSITY (INDIA); IHEP, PROTVINO (SERPUKHOV)(RUSSIA); RUTGERS UNIVERSITY; TUFTS UNIVERSITY

BEAM: Neutrino Area - Center
AN EXPOSURE OF THE 15-FOOT BUBBLE CHAMBER WITH A NEON-HYDROGEN MIXTURE TO A WIDEBAND NEUTRINO BEAM FROM THE TEVATRON.

Request	25 Apr, 80	250 K Pix
Approval	18 Jun, 82	1 E18th Protons Stage I approval.
	15 Dec, 83	1 E18th Protons Stage II approval.
Completed	1 Feb, 88	446 K Pix

635 NEUTRINO #635 — Luke W. Mo — FERMILAB; VIRGINIA TECH

BEAM: Neutrino Area - Prompt Beam
PROPOSAL TO MEASURE MUON NEUTRINO ELECTRON AND MUON ANTI-NEUTRINO ELECTRON ELASTIC SCATTERING, NEUTRINO OSCILLATIONS, AND DECAYS OF LONG-LIVED NEUTRAL PARTICLES AT THE TEVATRON OF FERMILAB.

Request	25 Apr, 80	... 3 x 10 to the 18th protons
	16 Mar, 83	Unspecified
Approval	12 Nov, 83	Unspecified Stage I approval.
Approved/Inactive	1 Feb, 88	Unspecified

636 BEAM DUMP #636 — Toshio Kitagaki and Irwin A. Pless — IHEP, BEIJING (PRC); BROWN UNIVERSITY; FERMILAB; INDIANA UNIVERSITY; MASSACHUSETTS INST. OF TECHNOLOGY; OAK RIDGE NATIONAL LABORATORY; TECHNION-ISRAEL INST (ISRAEL); UNIVERSITY OF TEL-AVIV (ISRAEL); UNIVERSITY OF TENNESSEE, KNOXVILLE; TOHOKU GAKUIN UNIVERSITY (JAPAN); TOHOKU UNIVERSITY (JAPAN)

BEAM: Neutrino Area - Prompt Beam
NEUTRINO INTERACTION STUDIES WITH A HEAVY LIQUID BUBBLE CHAMBER AT TEVATRON ENERGIES USING A BEAM DUMP TECHNIQUE TO PRODUCE THE NEUTRINO BEAM.

Request	25 Apr, 80	2.5 E18th Protons
Approval	14 Nov, 80	Unspecified
Approved/Inactive	1 Feb, 88	Unspecified

646 15-FT BEAM DUMP #646 — Michael W. Peters — UNIV. OF CALIFORNIA, BERKELEY; FERMILAB; UNIVERSITY OF HAWAII AT MANOA; ILLINOIS INSTITUTE OF TECHNOLOGY; RUTGERS UNIVERSITY; STEVENS INSTITUTE OF TECHNOLOGY; TUFTS UNIVERSITY

BEAM: Neutrino Area - Prompt Beam
SEARCH FOR THE TAU NEUTRINO AND STUDY OF ELECTRON NEUTRINO AND ELECTRON ANTI-NEUTRINO INTERACTIONS.

Request	25 Apr, 80	2 E18th Protons
Approval	1 Jul, 81	Unspecified
Approved/Inactive	1 Feb, 88	Unspecified

650 PARTICLE SEARCH #650 — Robert C. Webb — BROOKHAVEN NATIONAL LABORATORY; CEN-SACLAY (FRANCE); PRINCETON UNIVERSITY; TEXAS A&M UNIVERSITY; UNIVERSITY OF TORINO (ITALY)

BEAM: Proton Area - West
REQUEST FOR A CONTINUATION OF E-567.

Request	29 Apr/ 80	500 Hours
Approval	7 Jul, 80	500 Hours expected to run in the spring 1981 running period.
Completed	29 Dec, 80	550 Hours

653 PARTICLE SEARCH #653 — Neville W. Reay — AICHI UNIV. OF EDUCATION (JAPAN); UNIV. OF CALIFORNIA, DAVIS; CARNEGIE-MELLON UNIVERSITY; CHONNAM NATIONAL UNIVERSITY(KOREA); FERMILAB; GIFU UNIVERSITY (JAPAN); GYEONGSANG NATIONAL UNIV. (KOREA); KINKI UNIVERSITY (JAPAN); KOBE UNIVERSITY (JAPAN); KOREA UNIVERSITY, SEOUL (KOREA); NAGOYA INST. OF TECHNOLOGY (JAPAN); NAGOYA UNIVERSITY (JAPAN); OHIO STATE UNIVERSITY; OKAYAMA UNIVERSITY (JAPAN); UNIVERSITY OF OKLAHOMA; OSAKA CITY UNIVERSITY (JAPAN); OSAKA SCIENCE EDUC. INST. (JAPAN); TOHO UNIVERSITY (JAPAN); UTSUNOMIYA UNIVERSITY (JAPAN); WON KWANG UNIVERSITY, IRI (KOREA)

BEAM: Neutrino Area - East
A PROPOSAL TO MEASURE CHARM AND B DECAYS VIA HADRONIC PRODUCTION IN A HYBRID EMULSION SPECTROMETER.

Request	1 May, 80	1,500 Hours
Approval	1 Jul, 81	Unspecified
Completed	15 Feb, 88	1,800 Hours

660 CHANNELING #660 — Walter M. Gibson — CERN (SWITZERLAND); CHALK RIVER NUCLEAR LAB. (CANADA); FERMILAB; JINR, DUBNA (RUSSIA); UNIVERSITY OF NEW MEXICO; SUNY AT ALBANY; UNIVERSITY OF STRASBOURG (FRANCE)

BEAM: Meson Area - M4 Beam
PROPOSAL TO STUDY THE EFFECT OF BENT CRYSTALS ON CHANNELING NEAR THE CRITICAL RADIUS OF BENDING.

Request	10 Jun, 80	300 Hours
Approval	14 Nov, 80	400 Hours
Completed	13 Jun, 82	425 Hours

663 LAMBDA POLARIZATION #663 — Hans G. E. Kobrak
UNIV. OF CALIFORNIA, DAVIS; UNIV. OF CALIFORNIA, SAN DIEGO; CARELTON UNIVERSITY (CANADA); FERMILAB; MICHIGAN STATE UNIVERSITY
BEAM: Meson Area - M4 Beam
COMPARISON OF POLARIZATION OF INCLUSIVELY PRODUCED LAMBDAS AND ANTILAMBDAS BY PROTONS, ANTIPROTONS, KAONS AND PIONS ON HYDROGEN.

Request	29 Sep, 80	1,000 Hours
Approval	14 Nov, 80	800 Hours must be completed by July 1, 1981
Completed	1 Jun, 81	500 Hours

665 TEVATRON MUON #665 — Heidi M. Schellman
ARGONNE NATIONAL LABORATORY; UNIV. OF CALIFORNIA, SAN DIEGO; FERMILAB; FREIBURG UNIVERSITY (GERMANY); HARVARD UNIVERSITY; UNIV. OF ILLINOIS, CHICAGO CIRCLE; INP, KRAKOW (POLAND); LAWRENCE LIVERMORE LABORATORY; UNIVERSITY OF MARYLAND; MASSACHUSETTS INST. OF TECHNOLOGY; MAX-PLANCK INSTITUTE (GERMANY); NORTHWESTERN UNIVERSITY; OHIO UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; UNIVERSITY OF WASHINGTON; UNIVERSITY OF WUPPERTAL (GERMANY); YALE UNIVERSITY
BEAM: Neutrino Area - Muon Beam
MUON SCATTERING WITH HADRON DETECTION AT THE TEVATRON.

Request	3 Oct, 80	3,000 Hours
Approval	1 Jul, 81	1,000 Hours
	30 Jan, 89	... Tracking system upgrade.
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

666 EMULSION EXPOSURE #666 — Richard J. Wilkes
INP, KRAKOW (POLAND); UNIVERSITY OF WASHINGTON
BEAM: Proton Area - Center
EMULSION EXPOSURE TO SIGMA MINUS BEAM AT FERMILAB.

Request	2 Dec, 80	1 K Pix
Approval	2 Dec, 80	Unspecified
Completed	9 Mar, 81	6 Stack(s)

667 EMULSION/PI- @ 500 #667 — Wladyslaw Wolter
INP, KRAKOW (POLAND); LEBEDEV PHYSICAL INST. (RUSSIA); LOUISIANA STATE UNIVERSITY; TASHKENT, PHY.TEC.INS (UZBEKISTAN)
BEAM: Proton Area - East
STUDY OF PION-NUCLEUS INTERACTIONS IN PURE EMULSION STACKS AND EMULSION CHAMBERS AT ENERGY ABOVE 500 GEV.

Request	2 Dec, 80	Emulsion Exposure
Approval	28 Mar, 90	Unspecified
Completed	27 Aug, 90	Unspecified

668 EMULSION/PI- @ 800 #668 — Wladyslaw Wolter
INP, KRAKOW (POLAND)
BEAM: Unspecified Beam
STUDY OF PION NUCLEUS INTERACTIONS IN PURE EMULSION STACKS AND EMULSION CHAMBERS AT ENERGY ABOVE 800 GEV.

Request	2 Dec, 80	Emulsion Exposure
Completed	26 Apr, 85	Emulsion Exposure

672A HADRON JETS #672A — Andrzej Zieminski
FERMILAB; UNIV. OF ILLINOIS, CHICAGO CIRCLE; INDIANA UNIVERSITY; UNIVERSITY OF LOUISVILLE; UNIVERSITY OF MICHIGAN - FLINT; IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
BEAM: Meson Area - West
A STUDY OF HADRONIC FINAL STATES PRODUCED IN ASSOCIATION WITH HIGH-PT JETS AND HIGH-MASS DIMUONS.

Request	1 Feb, 81	2,000 Hours for data taking plus 500 hours for setup and testing
Approval	1 Jul, 81	Unspecified
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

673 CHI MESON #673 — John W. Cooper
FERMILAB; UNIVERSITY OF ILLINOIS, CHAMPAIGN; UNIVERSITY OF PENNSYLVANIA; PURDUE UNIVERSITY; TUFTS UNIVERSITY
BEAM: Neutrino Area - Muon/Hadron Beam
CHI MESON PRODUCTION BY HADRONS.
(E-610 extension.)

Request	1 Feb, 81	1,500 Hours to be run with Dichromatic train during the fall 1981 period
Approval	1 Jul, 81	Unspecified
Completed	14 Apr, 82	1,100 Hours

683 PHOTOPRODUCTION OF JETS #683 — Marjorie D. Corcoran
BALL STATE UNIVERSITY; FERMILAB; UNIVERSITY OF IOWA; UNIVERSITY OF MARYLAND; UNIVERSITY OF MICHIGAN - ANN ARBOR; RICE UNIVERSITY; VANDERBILT UNIVERSITY
BEAM: Proton Area - Broad Band
PHOTOPRODUCTION OF HIGH PT JETS.

Request	1 Feb, 81	1,200 Hours including 500 hours for tune-up, calibration and some hadron beam running
Approval	15 Dec, 83	Unspecified Stage I approval.
	4 Apr, 87	Unspecified Stage II approval.
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

687 PHOTOPRODUCTION OF CHARM AND B #687 — Joel N. Butler and John P. Cumalat
UNIV. OF CALIFORNIA, DAVIS; UNIVERSITY OF COLORADO AT BOULDER; FERMILAB; INFN, FRASCATI (ITALY); UNIVERSITY OF ILLINOIS, CHAMPAIGN; INFN, MILANO (ITALY); UNIVERSITY OF MILANO (ITALY); UNIVERSITY OF NORTH CAROLINA; NORTHWESTERN UNIVERSITY; NOTRE DAME UNIVERSITY; UNIVERSITY OF PAVIA (ITALY); UNIV. OF PUERTO RICO - RIO PIEDRAS
BEAM: Proton Area - Broad Band
HIGH ENERGY PHOTOPRODUCTION OF STATES CONTAINING HEAVY QUARKS AND OTHER RARE PHENOMENA.

Request	1 Feb, 81	2,000 Hours including a 500 hour run with a thick target and a beam dump and another 1500 hour run with an open geometry
Approval	1 Jul, 81	Unspecified Stage I approval.
	15 Dec, 83	Unspecified Stage II approval.
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

690 PARTICLE SEARCH #690 — Bruce C. Knapp
BEAM: Neutrino Area - East
STUDY OF HADRONIC PRODUCTION AND SPECTROSCOPY OF STRANGE, CHARM AND BOTTOM PARTICLES AT THE TEVATRON.
COLUMBIA UNIVERSITY
FERMILAB
UNIVERSITY OF GUANAJUATO (MEXICO)
UNIVERSITY OF MASSACHUSETTS
TEXAS A&M UNIVERSITY

Request	1 Feb, 81	1,400 Hours including 400 hours of target fragmentation measurements during installation and 1000 hours with full detector
Approval	1 Jul, 81	Unspecified
	12 Nov, 83	Unspecified Stage I approval.
	4 Apr, 87	Unspecified Stage II approval.
	8 Jan, 92	Unspecified
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

691 TAGGED PHOTON #691 — Michael S. Witherell
BEAM: Proton Area - East
PROPOSAL TO DO PHOTON PHYSICS WITH THE TEVATRON AT THE TAGGED PHOTON SPECTROMETER.
UNIV. OF CALIFORNIA, SANTA BARBARA
CARELTON UNIVERSITY (CANADA)
CBPF (BRAZIL)
UNIVERSITY OF COLORADO AT BOULDER
FERMILAB
NATIONAL RESEARCH COUNCIL (CANADA)
UNIVERSITY OF OKLAHOMA
UNIVERSITE OF SAO PAULO (BRAZIL)
UNIVERSITY OF TORONTO (CANADA)

Request	1 Feb, 81	1,000 Hours
Approval	12 Nov, 83	Unspecified Stage I approval.
Completed	29 Aug, 85	1,400 Hours

700 NEUTRINO OSCILLATION #700 — David J. Miller
BEAM: Neutrino Area - Prompt Beam
STUDY OF NEUTRINO OSCILLATIONS AND SEARCH FOR THE TAU NEUTRINO.
UNIVERSITY OF BARI (ITALY)
ECOLE POLYTECH, PALAISEAU (FRANCE)
ILLINOIS INSTITUTE OF TECHNOLOGY
LONDON UNIVERSITY COLLEGE(ENGLAND)
TUFTS UNIVERSITY

Request	10 Feb, 81	2.5 E18th Protons
Inactive	1 Apr, 84	

701 NEUTRINO OSCILLATION #701 — Michael H. Shaevitz
BEAM: Neutrino Area - Dichromatic
A SEARCH FOR NEUTRINO OSCILLATIONS WITH DELTA-M-SQUARE GREATER THAN 10 EV-SQUARE.
UNIVERSITY OF CHICAGO
COLUMBIA UNIVERSITY
FERMILAB
UNIVERSITY OF ROCHESTER

Request	12 Feb, 81	5.2 E18th Protons
Approval	1 Jul, 81	Unspecified
Completed	14 Jun, 82	2,250 Hours

702 PARTICLE SEARCH #702 — George Glass
BEAM: Internal Target Area (C-0)
SEARCH FOR PARTICLES WITH ANOMALOUS VALUES OF M/Q AND EXTREMELY SHORT INTERACTION LENGTHS (A REVISION OF P-607).
(To use recoil spectrometer with rotating be wire filament target.)
IHEP, BEIJING (PRC)
FERMILAB
NORTHEASTERN UNIVERSITY
TEXAS A&M UNIVERSITY

Request	12 Jun, 81	400 Hours for data and approximately 3 months to build and debug the apparatus
Inactive	1 Apr, 84	

703 ELECTRON TARGET FACILITY #703 — William R. Frisken
BEAM: Collision Area (D-0)
ELECTRON-PROTON COLLISIONS AT FERMILAB
(Electron-proton collisions using the canadian high energy electron ring cheer.)
CIPF (CANADA)
CARELTON UNIVERSITY (CANADA)
CEN-SACLAY (FRANCE)
CHALK RIVER NUCLEAR LAB. (CANADA)
UNIVERSITY OF CHICAGO
CORNELL UNIVERSITY
FERMILAB
UNIVERSITY OF MARYLAND
MCGILL UNIVERSITY (CANADA)
NATIONAL RESEARCH COUNCIL (CANADA)
UNIVERSITY OF SASKATCHEWAN(CANADA)
UNIVERSITY OF TORONTO (CANADA)
TRIUMF (CANADA)
YORK UNIVERSITY (CANADA)

Request	6 Jul, 81	1,000 Hours initial run to obtain 1 x 10 to the 4th inverse nanobarns. plus several later runs totalling 10 to the 6th inverse nanobarns
Inactive	23 Jun, 82	

704 POLARIZED BEAM #704 — Akihiko Yokosawa
BEAM: Meson Area - Polarized Proton Beam
INTEGRATED PROPOSAL ON FIRST ROUND EXPERIMENTS WITH THE POLARIZED BEAM FACILITY.
ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
FERMILAB
HIROSHIMA UNIVERSITY (JAPAN)
UNIVERSITY OF IOWA
KYOTO SANGYO UNIVERSITY (JAPAN)
KYOTO UNIVERSITY (JAPAN)
KYOTO UNIV. OF EDUCATION (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
LOS ALAMOS NATIONAL LABORATORY
NORTHWESTERN UNIVERSITY
UN. OF OCCUP. & ENV. HEALTH(JAPAN)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)
UNIVERSITY OF UDINE (ITALY)

Request	8 Sep, 81	1,200 Hours proposal to perform simultaneously substantial parts of experiments described in P676, P678, P674 and P677.
Approval	14 Dec, 81	Unspecified Stage I approval.
	15 Dec, 83	1,200 Hours Stage II approval.
Data Analysis	13 Aug, 90	Unspecified
Completed	1 Mar, 99	Unspecified

705	CHI MESON #705 BEAM: Proton Area - West A STUDY OF CHARMONIUM AND DIRECT PHOTON PRODUCTION BY 300 GEV/C ANTIPROTON,PROTON,PI+ AND PI- BEAMS.	Bradley B. Cox	UNIVERSITY OF SOUTH ALABAMA UNIVERSITY OF ARIZONA UNIVERSITY OF ATHENS (GREECE) DUKE UNIVERSITY FERMILAB UNIVERSITY OF FIRENZE (ITALY) MCGILL UNIVERSITY (CANADA) NANJING UNIVERSITY (PRC) NORTHWESTERN UNIVERSITY PRAIRIE VIEW A&M UNIVERSITY SHANDONG UNIVERSITY (PRC) SSC LABORATORY UNIVERSITY OF VIRGINIA

Request	1 Oct, 81	1,500 Hours
Approval	14 Dec, 81	1,500 Hours
Completed	15 Feb, 88	3,600 Hours

706	DIRECT PHOTON PRODUCTION #706 BEAM: Meson Area - West A Comprehensive Study of Direct Photon Production in Hadron Induced Collisions	Paul F. Slattery	UNIV. OF CALIFORNIA, DAVIS DELHI UNIVERSITY (INDIA) FERMILAB MICHIGAN STATE UNIVERSITY NORTHEASTERN UNIVERSITY UNIVERSITY OF OKLAHOMA PENNSYLVANIA STATE UNIVERSITY UNIVERSITY OF PITTSBURGH UNIVERSITY OF ROCHESTER

Request	26 Oct, 81	2,400 Hours
Approval	14 Dec, 81	1,000 Hours
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

707	SIGMA MINUS BETA DECAY #707 BEAM: Proton Area - Center MEASUREMENT OF THE ELECTRON ASYMMETRY PARAMETER IN SIGMA MINUS BETA DECAY.	Peter S. Cooper	UNIVERSITY OF CHICAGO FERMILAB IOWA STATE UNIVERSITY UNIVERSITY OF IOWA PNPI, ST. PETERSBURG (RUSSIA) YALE UNIVERSITY

Request	24 Nov, 81	300 Hours
Rejected	15 Dec, 81	

708	ELECTRON TARGET FACILITY #708 BEAM: Collision Area (D-0) ELECTRON-PROTON INTERACTION EXPERIMENT (Supercedes proposal #659.)	Wonyong Lee	ARGONNE NATIONAL LABORATORY BROOKHAVEN NATIONAL LABORATORY UNIVERSITY OF CHICAGO UNIVERSITY OF COLORADO AT BOULDER COLUMBIA UNIVERSITY FERMILAB HARVARD UNIVERSITY UNIVERSITY OF ILLINOIS, CHAMPAIGN UNIVERSITY OF MICHIGAN - ANN ARBOR NIKHEF-H (NETHERLANDS) UNIVERSITY OF PENNSYLVANIA PRINCETON UNIVERSITY ROCKEFELLER UNIVERSITY

Request	25 Nov, 81	Unspecified
Inactive	23 Jun, 82	

709	FORWARD DETECTOR #709 BEAM: Collision Area (D-0) PROPOSAL FOR A FORWARD DETECTOR FOR THE D0 AREA	Michael J. Longo	UNIV. OF ILLINOIS, CHICAGO CIRCLE UNIVERSITY OF MICHIGAN - ANN ARBOR

Request	11 Jan, 82	Unspecified
Rejected	23 Jun, 82	

710	TOTAL CROSS-SECTION #710 BEAM: Collision Area (E-0) MEASUREMENTS OF ELASTIC SCATTERING AND TOTAL CROSS SECTIONS AT THE FERMILAB PBAR-P COLLIDER.	Jay Orear and Roy Rubinstein	UNIVERSITY OF BOLOGNA (ITALY) CORNELL UNIVERSITY FERMILAB GEORGE MASON UNIVERSITY UNIVERSITY OF MARYLAND NORTHWESTERN UNIVERSITY

Request	1 Feb, 82	Unspecified
Approval	23 Jun, 82	Unspecified
Completed	31 May, 89	Unspecified

711	CONSTITUENT SCATTERING #711 BEAM: Neutrino Area - East A PROPOSAL TO MEASURE THE ENERGY, ANGULAR, AND CHARGE DEPENDENCE OF MASSIVE DI-HADRON PRODUCTION OVER A LARGE SOLID ANGLE IN INTENSE PROTON AND PION BEAMS.	David A. Levinthal	ARGONNE NATIONAL LABORATORY FERMILAB FLORIDA STATE UNIVERSITY UNIVERSITY OF MICHIGAN - ANN ARBOR

Request	28 Aug, 82	Unspecified
Approval	1 Jul, 83	Unspecified
Completed	15 Feb, 88	1,400 Hours

712	MUON PRODUCTON #712 BEAM: Collision Area (D-0) STUDY OF MUONS FROM PBAR-P COLLISIONS UP TO SQUARE ROOT OF S EQUAL TO 2 TEV.	Patrick D. Rapp	FERMILAB GEORGE MASON UNIVERSITY

Request	1 Feb, 82	Unspecified
Rejected	23 Jun, 82	

713	HIGHLY IONIZING PARTICLES #713 BEAM: Collision Area (D-0) PROPOSAL FOR A SEARCH FOR HIGHLY IONIZING PARTICLES FOR THE D0 AREA AT FERMILAB.	P. Buford Price	UNIV. OF CALIFORNIA, BERKELEY HARVARD UNIVERSITY

Request	29 Jan, 82	Unspecified
Approval	23 Jun, 82	Unspecified
Completed	31 May, 89	Unspecified

714	LARGE ANGLE PARTICLE #714 BEAM: Collision Area (D-0) LARGE ANGLE PARTICLE D0 GROUP	Paul D. Grannis	BROOKHAVEN NATIONAL LABORATORY BROWN UNIVERSITY COLUMBIA UNIVERSITY FERMILAB MICHIGAN STATE UNIVERSITY SUNY AT STONY BROOK

Request	5 Feb, 82	Unspecified
Rejected	1 Jul, 83	

715 SIGMA BETA DECAY #715 — Peter S. Cooper — UNIVERSITY OF CHICAGO, ELMHURST COLLEGE, FERMILAB, IOWA STATE UNIVERSITY, UNIVERSITY OF IOWA, PNPI, ST. PETERSBURG (RUSSIA), YALE UNIVERSITY
BEAM: Proton Area - Center
PRECISION MEASUREMENT OF THE DECAY SIGMA MINUS TO NEUTRON AND ELECTRON AND NEUTRINO.

Request	19 Feb, 82	Unspecified
Approval	23 Jun, 82	Unspecified for 3 months
Completed	14 Feb, 84	820 Hours

716 BEAM DUMP #716 — Byron P. Roe — FERMILAB, UNIVERSITY OF FIRENZE (ITALY), UNIVERSITY OF MICHIGAN - ANN ARBOR, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
PROPOSAL FOR FURTHER BEAM DUMP NEUTRINO RUNNING

Request	9 Feb, 82	Unspecified
Rejected	23 Jun, 82	

717 FORWARD DETECTOR #717 — Joseph Lach — FERMILAB
BEAM: Collision Area (D-0)
A FORWARD LOOKING DETECTOR FOR THE D0 AREA.

Request	19 Mar, 82	Unspecified
Rejected	23 Jun, 82	

718 CALORIMETERS AT D-0 #718 — Albert R. Erwin — ARGONNE NATIONAL LABORATORY, UNIVERSITY OF ARIZONA, FERMILAB, UNIVERSITY OF PENNSYLVANIA, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Collision Area (D-0)
STUDY OF PBAR-P INTERACTIONS USING CALORIMETERS AT D-0.

Request	1 Apr, 82	Unspecified
Rejected	23 Jun, 82	

719 ELECTRON TARGET FACILITY #719 — Wonyong Lee — ARGONNE NATIONAL LABORATORY, CARELTON UNIVERSITY (CANADA), CEN-SACLAY (FRANCE), CHALK RIVER NUCLEAR LAB. (CANADA), UNIVERSITY OF COLORADO AT BOULDER, COLUMBIA UNIVERSITY, FERMILAB, HARVARD UNIVERSITY, UNIVERSITY OF ILLINOIS, CHAMPAIGN, JOHNS HOPKINS UNIVERSITY, UNIVERSITY OF MARYLAND, MCGILL UNIVERSITY (CANADA), UNIVERSITY OF MICHIGAN - ANN ARBOR, MICHIGAN STATE UNIVERSITY, NIKHEF-H (NETHERLANDS), UNIVERSITY OF PENNSYLVANIA, PRINCETON UNIVERSITY, RICE UNIVERSITY, ROCKEFELLER UNIVERSITY, UNIVERSITY OF SASKATCHEWAN(CANADA), UNIVERSITY OF TORONTO (CANADA)
BEAM: Collision Area (D-0)
ELECTRON-PROTON INTERACTION EXPERIMENT.
(This proposal supercedes proposals #703 and #708.)

Request	14 May, 82	Unspecified
Not Approved	23 Jun, 82	

720 FREE QUARK SEARCH #720 — John P. Schiffer — ARGONNE NATIONAL LABORATORY, FERMILAB
BEAM: Miscellaneous Area
PROPOSAL TO SEARCH FOR +1/3E STABLE PARTICLES USING CRYOGENIC SOURCES.

Request	29 Jan, 82	Unspecified
Approval	15 Mar, 82	Unspecified for 3 months
	2 Jun, 82	Unspecified
Completed	8 Oct, 82	Unspecified

721 CP VIOLATION #721 — Jerome L. Rosen — UNIVERSITY OF ARIZONA, UNIVERSITY OF ATHENS (GREECE), DUKE UNIVERSITY, FERMILAB, FLORIDA A&M UNIVERSITY, MCGILL UNIVERSITY (CANADA), NORTHWESTERN UNIVERSITY, SHANDONG UNIVERSITY (PRC)
BEAM: Proton Area - West
AN EXPERIMENT TO STUDY CP VIOLATION IN THE DECAY OF K-LONG PRODUCED BY ANTI-PROTONS.

Request	11 Jun, 82	Unspecified
Approval	12 Mar, 84	Test Running
Approved/Inactive	30 Jun, 87	Unspecified

722 D-0 STREAMER CHAMBER #722 — V. Paul Kenney — UNIVERSITY OF CAMBRIDGE (ENGLAND), NOTRE DAME UNIVERSITY
BEAM: Collision Area (D-0)
STREAMER CHAMBER EXPERIMENT AT THE TEVATRON COLLIDER.

Request	11 Oct, 82	Unspecified
Inactive	18 Feb, 83	

723 GRAVITATIONAL DETECTOR #723 — Adrian Melissinos — FERMILAB, UNIVERSITY OF ROCHESTER
BEAM: Collision Area (C-0)
TEST OF A GRAVITATIONAL DETECTOR AT THE TEVATRON COLLIDER.

Request	21 Oct, 82	Unspecified
Approval	12 Mar, 84	Test Running
Completed	29 Aug, 85	Test Running

724 CALORIMETRIC DETECTOR #724 — Michael J. Longo — CALIFORNIA INSTITUTE OF TECHNOLOGY, UNIV. OF ILLINOIS, CHICAGO CIRCLE, MCGILL UNIVERSITY (CANADA), UNIVERSITY OF MICHIGAN - ANN ARBOR, NOTRE DAME UNIVERSITY
BEAM: Collision Area (D-0)
COMPLETE CALORIMETRIC DETECTOR FOR THE D-0 AREA.

Request	26 Oct, 82	Unspecified
Rejected	1 Jul, 83	

725 DIFFRACTION DISSOCIATION #725 — Konstantin Goulianos — ROCKEFELLER UNIVERSITY
BEAM: Collision Area (D-0)
A PROPOSAL TO MEASURE SINGLE AND DOUBLE DIFFRACTION DISSOCIATION AT THE FERMILAB PBAR-P COLLIDER.

Request	1 Nov, 82	Unspecified
Rejected	1 Jul, 83	

726 CALORIMETRIC DETECTOR #726 — Maris A. Abolins — UNIVERSITY OF ARIZONA, FERMILAB, MICHIGAN STATE UNIVERSITY, UNIVERSITY OF PENNSYLVANIA
BEAM: Collision Area (D-0)
PROPOSED CALORIMETRIC DETECTOR FOR THE D-0 AREA.

Request	1 Nov, 82	Unspecified
Rejected	1 Jul, 83	

727 FORWARD CALORIMETER #727 — Jerome L. Rosen — NORTHWESTERN UNIVERSITY
BEAM: Collision Area (D-0)
SPLIT-FIELD MAGNET SPECTROMETER AND ELECTROMAGNETIC SHOWER DETECTOR FOR D-0.

Request	2 Nov, 82	Unspecified
Withdrawn	16 May, 83	

728 MUON PRODUCTION #728 — Daniel R. Green — UNIVERSITY OF ARIZONA, FERMILAB, FLORIDA STATE UNIVERSITY, UNIVERSITY OF MARYLAND, VIRGINIA TECH
BEAM: Collision Area (D-0)
STUDY OF MUONS FROM PBAR-P COLLISIONS UP TO SQUARE ROOT OF S EQUAL TO 2 TEV.
(This proposal supercedes proposal #712.)

Request	1 Nov, 82	Unspecified
Rejected	1 Jul, 83	

729 EMULSION/PROTONS @ 1 TEV #729 — Atul Gurtu — TATA INSTITUTE (INDIA)
BEAM: Meson Area - Test Beam
PROPOSAL TO STUDY CHARM AND MULTIPARTICLE PRODUCTION IN 1 TEV PROTON-EMULSION COLLISIONS

Request	24 Nov, 82	Unspecified
Approval	5 Dec, 83	Emulsion Exposure
Completed	26 Apr, 85	2 Emulsion Stack(s)

730 EMULSION/SIGMA-MINUS @ 250 #730 — Richard J. Wilkes — INP, KRAKOW (POLAND), INST.FOR NUCL. RESEARCH (BULGARIA), UNIVERSITY OF WASHINGTON
BEAM: Proton Area - Center
EMULSION EXPOSURE TO 250 GEV SIGMA-MINUS.

Request	5 Jan, 83	Unspecified
Approval	10 Feb, 84	Unspecified
Completed	10 Feb, 84	4 Hours

731 CP VIOLATION #731 — Bruce D. Winstein — CEN-SACLAY (FRANCE), UNIVERSITY OF CHICAGO, ELMHURST COLLEGE, FERMILAB, *PRINCETON UNIVERSITY*
BEAM: Meson Area - Center
A MEASUREMENT OF THE MAGNITUDE OF (E'/E) IN THE NEUTRAL KAON SYSTEM TO A PRECISION OF .001.

Request	1 Feb, 83	Unspecified
Approval	1 Jul, 83	Unspecified
Completed	15 Feb, 88	3,100 Hours

732 XI-ZERO DECAY #732 — Marleigh C. Sheaff — UNIVERSITY OF MICHIGAN - ANN ARBOR, UNIVERSITY OF MINNESOTA, RUTGERS UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Proton Area - Center
A SEARCH FOR THE DECAY NEUTRAL CASCADE TO PROTON AND NEGATIVE PION.

Request	1 Feb, 83	Unspecified
Rejected	25 Jun, 85	

733 NEUTRINO INTERACTIONS #733 — Raymond L. (Chip) Brock — FERMILAB, UNIVERSITY OF FLORIDA, MASSACHUSETTS INST. OF TECHNOLOGY, MICHIGAN STATE UNIVERSITY
BEAM: Neutrino Area - Center
PROPOSAL TO STUDY HIGH ENERGY NEUTRINO INTERACTIONS WITH THE TEVATRON QUADRUPOLE TRIPLET BEAM.

Request	1 Feb, 83	Unspecified
	16 Sep, 83	Unspecified
Approval	12 Nov, 83	Unspecified Stage I approval.
Completed	1 Feb, 88	4,100 Hours

734 HYPERON PRODUCTION #734 — Michael V. Hynes — UNIV. OF CALIFORNIA, LOS ANGELES, LOS ALAMOS NATIONAL LABORATORY
BEAM: Proton Area - Center
PRIMAKOFF PRODUCTION OF HYPERON EXCITED STATES.

Request	1 Apr, 83	Unspecified
Inactive	21 May, 86	

735 PARTICLE SEARCH #735 — Laszlo J. Gutay — DUKE UNIVERSITY, FERMILAB, IOWA STATE UNIVERSITY, NOTRE DAME UNIVERSITY, PURDUE UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Collision Area (C-0)
SEARCH FOR A DECONFINED QUARK GLUON PHASE OF STRONGLY INTERACTING MATTER IN PBAR-P INTERACTIONS AT SQUARE ROOT OF S EQUAL TO 2 TEV.

Request	11 Apr, 83	Unspecified
	16 Sep, 83	Unspecified
Approval	15 Dec, 83	Unspecified Stage I approval.
Completed	31 May, 89	Unspecified

736 D-0 QUARK SEARCH #736 — *Robert K. Adair* — BROOKHAVEN NATIONAL LABORATORY, YALE UNIVERSITY
BEAM: Collision Area (D-0)
A PROPOSAL TO CONDUCT A QUARK SEARCH AT THE FERMILAB COLLIDER.

Request	11 Apr, 83	Unspecified
Rejected	1 Jul, 83	

737 BATISS EXPERIMENT #737 — Peter Kotzer — KAZAKH STATE UNIV., (KAZAKHSTAN), MOSCOW STATE UNIVERSITY (RUSSIA), UNIVERSITY OF WASHINGTON, WESTERN WASHINGTON UNIVERSITY
BEAM: Unspecified Beam
STUDY OF HIGH ENERGY NEUTRINOS WITH A DEEP UNDERWATER DETECTOR OF A MASS GREATER THAN 10 TO THE 6TH TONS.

Request	25 Apr, 83	Unspecified
Rejected	12 Nov, 83	

738 NARROW BAND #738 — Charles Baltay — COLUMBIA UNIVERSITY
BEAM: Neutrino Area - Center
LETTER OF INTENT TO RUN IN THE NARROW BAND AND BEAM AT TEVATRON II.

Request	3 Jun, 83	Unspecified
Withdrawn	26 Apr, 84	

739 ELECTRON-POSITRON #739 — Nelson Cue and Chih-Ree Sun — UNIV. OF CLAUDE BERNARD (FRANCE), FERMILAB, LAPP, D'ANNECY-LE-VIEUX (FRANCE), SUNY AT ALBANY
BEAM: Proton Area - East
MEASUREMENTS OF CRYSTAL-ASSISTED ELECTRON-POSITRON PAIR CREATION.

Request	9 Sep, 83	Unspecified
Rejected	19 Apr, 85	

740 D-0 DETECTOR #740 — Paul D. Grannis and Hugh Elliott Montgomery — UNIVERSIDAD DE LOS ANDES(COLOMBIA), UNIVERSITY OF ARIZONA, BOSTON UNIVERSITY, BROOKHAVEN NATIONAL LABORATORY, BROWN UNIVERSITY, UNIVERSIDAD DE BUENOS AIRES, UNIV. OF CALIFORNIA, DAVIS, UNIV. OF CALIFORNIA, IRVINE, UNIV. OF CALIFORNIA, RIVERSIDE, CBPF (BRAZIL), CEN-SACLAY (FRANCE), CINVESTAV-IPN (MEXICO), COLUMBIA UNIVERSITY, DELHI UNIVERSITY (INDIA), FERMILAB, FLORIDA STATE UNIVERSITY, UNIVERSITY OF HAWAII AT MANOA, UNIV. OF ILLINOIS, CHICAGO CIRCLE, INDIANA UNIVERSITY, IOWA STATE UNIVERSITY, JINR, DUBNA (RUSSIA), KOREA UNIVERSITY, SEOUL (KOREA), INP, KRAKOW (POLAND), KYUNGSUNG UNIVERSITY, PUSAN(KOREA), LAWRENCE BERKELEY LABORATORY, UNIVERSITY OF MARYLAND, UNIVERSITY OF MICHIGAN - ANN ARBOR, MICHIGAN STATE UNIVERSITY, MOSCOW STATE UNIVERSITY (RUSSIA), UNIVERSITY OF NEBRASKA, SUNY AT STONY BROOK, NEW YORK UNIVERSITY, NORTHEASTERN UNIVERSITY, NORTHERN ILLINOIS UNIVERSITY, NORTHWESTERN UNIVERSITY, NOTRE DAME UNIVERSITY, UNIVERSITY OF OKLAHOMA, PANJAB UNIVERSITY (INDIA), PNPI, ST. PETERSBURG (RUSSIA), IHEP, PROTVINO (SERPUKHOV)(RUSSIA), PURDUE UNIVERSITY, RICE UNIVERSITY, UNIV. FEDERAL DO RIO DE JANEIRO, UNIVERSITY OF ROCHESTER, SEOUL NATIONAL UNIVERSITY (KOREA), SSC LABORATORY, TATA INSTITUTE (INDIA), TEXAS A&M UNIVERSITY, UNIVERSITY OF TEXAS AT ARLINGTON
BEAM: Collision Area (D-0)
STUDY OF PROTON ANTI-PROTON COLLISIONS USING A LARGE DETECTOR AT D-0.

Request	9 Sep, 83	Unspecified
Approval	10 Feb, 84	Unspecified
Data Analysis	20 Feb, 96	

741 COLLIDER DETECTOR #741 — Melvyn Jay Shochet and Alvin V. Tollestrup — ARGONNE NATIONAL LABORATORY, BRANDEIS UNIVERSITY, UNIVERSITY OF CHICAGO, FERMILAB, INFN, FRASCATI (ITALY), HARVARD UNIVERSITY, UNIVERSITY OF ILLINOIS, CHAMPAIGN, KEK (JAPAN), LAWRENCE BERKELEY LABORATORY, UNIVERSITY OF PENNSYLVANIA, INFN, PISA (ITALY), PURDUE UNIVERSITY, ROCKEFELLER UNIVERSITY, RUTGERS UNIVERSITY, TEXAS A&M UNIVERSITY, UNIVERSITY OF TSUKUBA (JAPAN), UNIVERSITY OF WISCONSIN - MADISON
BEAM: Collision Area (B-0)
STUDY OF PROTON ANTI-PROTON COLLISIONS USING A LARGE DETECTOR AT B-0.

Request	1 Apr, 82	Unspecified
Approval	1 Apr, 82	Unspecified
Completed	31 May, 89	Unspecified

742 STRANGE QUARK #742 — Joseph Lach — UNIVERSITY OF CHICAGO, ELMHURST COLLEGE, FERMILAB, IOWA STATE UNIVERSITY, UNIVERSITY OF IOWA, PNPI, ST. PETERSBURG (RUSSIA), YALE UNIVERSITY
BEAM: Proton Area - Center
LETTER OF INTENT TO MEASURE OMEGA MINUS POLARIZATION AND MAGNETIC MOMENT.

Request	13 Jun, 83	Unspecified
Inactive	15 Jun, 85	

743 CHARM PRODUCTION #743 — Stephen Reucroft
BEAM: Meson Area - Test Beam
PROPOSAL TO MEASURE OPEN CHARM PRODUCTION IN PROTON-PROTON COLLISIONS AT 1 TEV WITH LEBC-FMPS.
ITP, AACHEN (GERMANY)
CERN (SWITZERLAND)
CRN, STRASBOURG (FRANCE)
DUKE UNIVERSITY
FERMILAB
FLORIDA STATE UNIVERSITY
IHEP, BERLIN-ZEUTHEN (GERMANY)
UNIVERSITY OF KANSAS
UNIVERSITY OF L'ETAT (BELGIUM)
UNIVERSITY OF LIBRE (BELGIUM)
LPNHE, UN. OF P & M CURIE (FRANCE)
UNIVERSITY OF MICHIGAN - ANN ARBOR
MICHIGAN STATE UNIVERSITY
NORTHEASTERN UNIVERSITY
NOTRE DAME UNIVERSITY
TATA INSTITUTE (INDIA)
VANDERBILT UNIVERSITY
VIENNA INSTITUTE FUR HEP (AUSTRIA)

Request	16 Sep, 83	Unspecified
Approval	16 Dec, 83	Unspecified Stage I approval.
Completed	29 Aug, 85	1,256 K Pix

744 CHARGED INTERACTIONS #744 — Frank S. Merritt
BEAM: Neutrino Area - Center
HIGH STATISTICS STUDIES OF CHARGED CURRENT INTERACTIONS USING THE TEVATRON QUAD TRIPLET BEAM.
UNIVERSITY OF CHICAGO
COLUMBIA UNIVERSITY
FERMILAB
UNIVERSITY OF ROCHESTER

Request	16 Sep, 83	Unspecified
Approval	17 Nov, 83	Unspecified Stage I approval.
Completed	29 Aug, 85	1,900 Hours

745 MUON NEUTRINO #745 — Toshio Kitagaki
BEAM: Neutrino Area - Center
MUON NEUTRINO EXPERIMENT USING THE TOHOKU HIGH RESOLUTION ONE METER BUBBLE CHAMBER.
IHEP, BEIJING (PRC)
BROWN UNIVERSITY
FERMILAB
INDIANA UNIVERSITY
MASSACHUSETTS INST. OF TECHNOLOGY
NAGOYA UNIVERSITY (JAPAN)
OAK RIDGE NATIONAL LABORATORY
UNIVERSITY OF TENNESSEE, KNOXVILLE
TOHOKU GAKUIN UNIVERSITY (JAPAN)
TOHOKU UNIVERSITY (JAPAN)

Request	10 Sep, 83	Unspecified
Approval	16 Dec, 83	Parasitic Running
Completed	1 Feb, 88	553 K Pix

746 PROMPT BEAM FACILITY #746 — James K. Walker
BEAM: Neutrino Area - Prompt Beam
LETTER OF INTENT TO SEARCH FOR NEW PARTICLES FROM THE PROMPT BEAM FACILITY.
FERMILAB
MASSACHUSETTS INST. OF TECHNOLOGY
MICHIGAN STATE UNIVERSITY

Request	1 Sep, 83	Unspecified
Withdrawn	2 Jun, 86	

747 CHARGED PARTICLES #747 — Alan A. Hahn
BEAM: Proton Area - Broad Band
A SEARCH FOR FRACTIONALLY CHARGED PARTICLES AT THE TEVATRON.
CALIFORNIA INSTITUTE OF TECHNOLOGY
UNIV. OF CALIFORNIA, IRVINE
FERMILAB
LAWRENCE BERKELEY LABORATORY
LAWRENCE LIVERMORE LABORATORY
LOS ALAMOS NATIONAL LABORATORY
UNIVERSITY OF ROCHESTER
SAN FRANCISCO STATE UNIVERSITY
UNIVERSITY OF TORONTO (CANADA)

Request	27 Feb, 84	Unspecified
Approval	1 Apr, 85	Unspecified
Completed	2 Aug, 85	Unspecified

748 BEAUTY & CHARM PRODUCTION #748 — Jack Sandweiss
BEAM: Unspecified Beam
LETTER OF INTENT TO STUDY BEAUTY AND CHARM AT THE TEVATRON USING HIGH RESOLUTION STEAMER CHAMBER AND A DOWNSTREAM SPECTROMETER.
FERMILAB
NEW YORK UNIVERSITY
UNIVERSITY OF VRIJE (BELGIUM)
YALE UNIVERSITY

Request	7 May, 84	Unspecified
Withdrawn	2 Oct, 84	

749 CHANNELING #749 — James S. Forster
BEAM: Meson Area - Bottom
LETTER OF INTENT TO STUDY MATERIAL AND FABRICATION ASPECTS OF CRYSTALS USED FOR CHANNELING.
CHALK RIVER NUCLEAR LAB. (CANADA)
FERMILAB
UNIVERSITY OF NEW MEXICO
SUNY AT ALBANY

Request	19 Jul, 84	400 Hours
Withdrawn	1 Oct, 84	

750 MULTIPARTICLE PRODUCTION #750 — Ram K. Shivpuri
BEAM: Neutrino Area - Miscellaneous
A PROPOSAL TO STUDY MULTIPARTICLE PRODUCTION IN INTERACTIONS OF 1 TEV PROTONS WITH EMULSION NUCLEI.
DELHI UNIVERSITY (INDIA)

Request	27 Jun, 84	Emulsion Exposure beam at or near 1 TeV protons of flux approximately 5 x 10 to the 4th protons/sq cm over an area of (8 x 3)sq cm
Approval	23 Jul, 84	Emulsion Exposure
Completed	11 Jul, 85	1 Emulsion Stack(s)

751 EMULSION EXPOSURE @ 1 TEV #751 — Piyare L. Jain
BEAM: Meson Area - Test Beam
PROPOSAL TO STUDY 1 TEV PROTON INTERACTIONS IN EMULSION.
SUNY AT BUFFALO

Request	27 Jun, 84	Emulsion Exposure
Approval	2 Jul, 84	Emulsion Exposure
Completed	26 Apr, 85	1 Emulsion Stack(s)

752 PARTICLE COLLISIONS #752 — James W. Cronin
BEAM: Unspecified Beam
PROPOSAL TO SEARCH FOR ANOMALOUSLY LARGE HADRON CROSS SECTIONS AT SHORT DISTANCES.
UNIVERSITY OF CHICAGO
TECHNION-ISRAEL INST (ISRAEL)

Request	23 Oct, 84	200 Hours
Withdrawn	8 Dec, 86	

753 CHANNELING STUDIES #753 — James S. Forster
BEAM: Meson Area - Bottom
PROPOSAL TO IMPROVE THE DEFLECTION OF HIGH ENERGY PARTICLE BEAMS BY CHANNELING IN BENT CRYSTALS OF SI AND GE.
BELL NORTHERN RESEARCH LAB(CANADA)
CHALK RIVER NUCLEAR LAB. (CANADA)
FERMILAB
UNIVERSITY OF NEW MEXICO
SUNY AT ALBANY

Request	28 Sep, 84	400 Hours
Approval	20 Nov, 84	Unspecified
Completed	5 Jul, 85	150 Hours

754 CHANNELING TESTS #754 — Chih-Ree Sun
BEAM: Meson Area - Bottom
CRYSTAL CHANNELING TESTS IN M-BOTTOM INCLUDING FOCUSING WITH DEFORMED CRYSTALS AND STUDIES OF HIGH Z CRYSTALS.
FERMILAB
GENERAL ELECTRIC R&D CENTER
SUNY AT ALBANY
SANDIA LABORATORIES
SSC LABORATORY

Request	1 Oct, 84	300 Hours
Approval	20 Nov, 84	Unspecified
Approved/Inactive	24 Dec, 91	

755 BEAUTY & CHARM STUDY #T755 — Richard D. Majka and Anna Jean Slaughter
BEAM: Meson Area - Test Beam
A HIGH SENSITIVITY STUDY OF BEAUTY AND CHARM IN HADROPRODUCTION AT THE TEVATRON.
FERMILAB
YALE UNIVERSITY

Request	2 Oct, 84	Unspecified
Approval	25 Nov, 86	Unspecified
Completed	15 Feb, 88	Unspecified

756 MAGNETIC MOMENT #756 — Kam-Biu Luk
BEAM: Proton Area - Center
MEASUREMENT OF THE MAGNETIC MOMENT OF THE OMEGA MINUS HYPERON.
UNIVERSITY OF ARIZONA
UNIV. OF CALIFORNIA, BERKELEY
FERMILAB
INDIANA UNIVERSITY
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF MINNESOTA
RUTGERS UNIVERSITY

Request	8 Oct, 84	1,000 Hours
Approval	25 Jun, 85	1,000 Hours Stage I approval.
Completed	15 Feb, 88	1,700 Hours

757 MUON DEFLECTION #757 — Jorge G. Morfin
BEAM: Neutrino Area - Muon Beam
LETTER OF INTENT FOR A PROPOSAL TO STUDY MOMENTUM RESOLUTION FOR MUONS ABOVE 300 GEV IN MAGNETIZED IRON.
FERMILAB
UNIVERSITY OF ILLINOIS, CHAMPAIGN
UNIVERSITY OF WASHINGTON
UNIVERSITY OF WISCONSIN - MADISON

Request	12 Dec, 84	Test Running
Rejected	14 Dec, 85	

758 EMULSION EXPOSURE #758 — Mitsuko Kazuno and Hiroshi Shibuya
BEAM: Meson Area - Test Beam
STUDY OF THE MECHANISM OF MULTIPARTICLE PRODUCTION IN EMULSION NUCLEI @ 800 GEV PROTONS.
NAGOYA UNIVERSITY (JAPAN)
TOHO UNIVERSITY (JAPAN)

Request	11 Mar, 85	Unspecified
Approval	11 Mar, 85	Unspecified
Completed	26 Apr, 85	2 Emulsion Stack(s)

759 EMULSION EXPOSURE #759 — Yoshihiro Tsuzuki
BEAM: Meson Area - Test Beam
A STUDY OF NUCLEAR INTERACTIONS OF 800 GEV PROTONS IN EMULSION.
KOBE UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)

Request	11 Mar, 85	Unspecified
Approval	11 Mar, 85	Unspecified
Completed	26 Apr, 85	2 Emulsion Stack(s)

760 CHARMONIUM STATES #760 — Rosanna Cester
BEAM: Accumulator Ring
A PROPOSAL TO INVESTIGATE THE FORMATION OF CHARMONIUM STATES USING THE PBAR ACCUMULATOR RING.
UNIV. OF CALIFORNIA, IRVINE
FERMILAB
UNIVERSITY OF FERRARA (ITALY)
INFN, GENOVA (ITALY)
NORTHWESTERN UNIVERSITY
PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY OF TORINO (ITALY)

Request	29 Mar, 85	Unspecified
Approval	25 Jun, 85	Unspecified
Data Analysis	10 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

761 HYPERON RADIATIVE DECAY #761 — Alexei A. Vorobiev
BEAM: Proton Area - Center
PROPOSAL TO STUDY HYPERON RADIATIVE DECAY.
IHEP, BEIJING (PRC)
UNIVERSITY OF BRISTOL (ENGLAND),
CBPF (BRAZIL)
FERMILAB
UNIVERSITY OF IOWA
ITEP, MOSCOW (RUSSIA)
PNPI, ST. PETERSBURG (RUSSIA)
UNIV. FEDERAL DO RIO DE JANEIRO
UNIVERSITE OF SAO PAULO (BRAZIL)
YALE UNIVERSITY

Request	3 Apr, 85	Unspecified
Approval	25 Jun, 85	Unspecified Stage I approval.
Completed	27 Aug, 90	Unspecified

762 EMULSION/PROTONS @ 800 GEV #762 — Shoji Dake
BEAM: Meson Area - Test Beam
CASCADE SHOWERS ORIGINATING IN PROTON-NUCLEUS COLLISIONS.
AOYAMA GAKUIN UNIVERSITY (JAPAN)
ICRR, UNIVERSITY OF TOKYO (JAPAN)
KOBE UNIVERSITY (JAPAN)
OKAYAMA UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)

Request	11 Jun, 85	Unspecified
Approval	21 Jun, 85	Unspecified
Completed	11 Jul, 85	18 Emulsion Stack(s)

763 EMULSION/PROTONS @ 800 GEV #763 — Takeshi Ogata
BEAM: Meson Area - Test Beam
PROTON-NUCLEUS INTERACTIONS AT TEVATRON ENERGY.
ICRR, UNIVERSITY OF TOKYO (JAPAN)
KOBE UNIVERSITY (JAPAN)
OKAYAMA UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)

Request	11 Jun, 85	Unspecified
Approval	21 Jun, 85	Unspecified
Completed	11 Jul, 85	2 Emulsion Stack(s)

764 EMULSION EXPOSURE #764 — Hirotada Nanjo — HIROSAKI UNIVERSITY (JAPAN)
BEAM: Meson Area - Test Beam
EXCLUSIVE INVESTIGATION OF MULTIPLE PRODUCTION IN RAPIDITY SPACE.

Request	11 Jun, 85	Unspecified
Approval	21 Jun, 85	Unspecified
Completed	11 Jul, 85	1 Emulsion Stack(s)

765 EMULSION/PROTONS @ 800 GEV #765 — K. Imaeda — OKAYAMA UNIVERSITY (JAPAN)
BEAM: Meson Area - Test Beam
TRANSVERSE MOMENTUM MEASUREMENT OF SECONDARY PARTICLES IN PROTON-EMULSION COLLISIONS AT 800 GEV.

Request	20 Jun, 85	Unspecified
Approval	21 Jun, 85	Unspecified
Completed	11 Jul, 85	7 Emulsion Stack(s)

766 MR TUNNEL NEUTRONS #T766 — Joseph B. McCaslin — FERMILAB; LAWRENCE BERKELEY LABORATORY
BEAM: Collision Area (Miscellaneous)
MEASUREMENTS OF THE NEUTRON SPECTRUM IN THE TEVATRON TUNNEL WITH APPLICATION TO THE SSC.

Request	11 Jul, 85	Unspecified
Approval	17 Jul, 85	Unspecified
Completed	13 Oct, 85	Unspecified

767 MUON CALORIMETRY #767 — Yasushi Muraki — CHUO UNIVERSITY (JAPAN); ICRR, UNIVERSITY OF TOKYO (JAPAN); KEK (JAPAN); NAGOYA UNIVERSITY (JAPAN)
BEAM: Neutrino Area - Muon Beam
MEASUREMENT OF DIRECT ELECTRON PAIR PRODUCTION CROSS-SECTION IN THE TEVATRON MUON BEAM.

Request	29 Aug, 85	Unspecified
Rejected	1 Jul, 86	

768 POLARIZED SCATTERING #768 — Alan D. Krisch — BROOKHAVEN NATIONAL LABORATORY; CERN (SWITZERLAND); FERMILAB; LHE, ETH HONGGERBERG (SWITZERLAND); UNIVERSITY OF MARYLAND; MASSACHUSETTS INST. OF TECHNOLOGY; UNIVERSITY OF MICHIGAN - ANN ARBOR; NOTRE DAME UNIVERSITY; TEXAS A&M UNIVERSITY
BEAM: Proton Area - West
PROTON - PROTON ELASTIC SCATTERING WITH A POLARIZED TARGET.

Request	12 Nov, 85	Unspecified
Rejected	30 Jun, 87	

769 PION & KAON CHARM PROD. #769 — Jeffrey A. Appel — CBPF (BRAZIL); FERMILAB; UNIVERSITY OF MISSISSIPPI; NORTHEASTERN UNIVERSITY; UNIVERSITY OF TORONTO (CANADA); TUFTS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON; YALE UNIVERSITY
BEAM: Proton Area - East
PION AND KAON PRODUCTION OF CHARM AND CHARM-STRANGE STATE.

Request	14 Dec, 85	Unspecified
Approval	14 Dec, 85	Unspecified
Data Analysis	15 Feb, 88	1,900 Hours
Completed	1 Mar, 99	Unspecified

770 QUAD TRIPLET NEUTRINO #770 — Wesley H. Smith — UNIVERSITY OF CHICAGO; COLUMBIA UNIVERSITY; FERMILAB; UNIVERSITY OF ROCHESTER; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Neutrino Area - Center
HIGH STATISTICS STUDIES OF CHARGED CURRENT INTERACTIONS USING THE TEVATRON QUAD TRIPLET BEAM.

Request	27 Dec, 85	Unspecified
Approval	27 Dec, 85	Unspecified Stage I approval.
Completed	1 Feb, 88	1,600 Hours

771 BEAUTY PRODUCTION BY PROTONS #771 — Bradley B. Cox — UNIVERSITY OF SOUTH ALABAMA; UNIVERSITY OF ATHENS (GREECE); BROWN UNIVERSITY; UNIV. OF CALIFORNIA, BERKELEY; UNIV. OF CALIFORNIA, LOS ANGELES; DUKE UNIVERSITY; FERMILAB; UNIVERSITY OF HOUSTON; JINR, DUBNA (RUSSIA); UNIVERSITY OF LECCE (ITALY); MASSACHUSETTS INST. OF TECHNOLOGY; MCGILL UNIVERSITY (CANADA); NANJING UNIVERSITY (PRC); NORTHWESTERN UNIVERSITY; UNIVERSITY OF PAVIA (ITALY); UNIVERSITY OF PENNSYLVANIA; PRAIRIE VIEW A&M UNIVERSITY; SHANDONG UNIVERSITY (PRC); VANIER COLLEGE (CANADA); UNIVERSITY OF VIRGINIA; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Proton Area - West
PROPOSAL TO STUDY BEAUTY PRODUCTION AND OTHER HEAVY QUARK PHYSICS ASSOCIATED WITH DIMUON PRODUCTION IN 800 (925) GEV/C PP INTERACTIONS.

Request	10 Dec, 86	Unspecified
Approval	4 Apr, 87	Unspecified
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

772 DIMUONS #772 — Joel M. Moss — CASE WESTERN RESERVE UNIVERSITY; FERMILAB; UNIV. OF ILLINOIS, CHICAGO CIRCLE; LOS ALAMOS NATIONAL LABORATORY; SUNY AT STONY BROOK; NORTHERN ILLINOIS UNIVERSITY; RUTGERS UNIVERSITY; UNIVERSITY OF SOUTH CAROLINA; UNIVERSITY OF TEXAS AT AUSTIN; UNIVERSITY OF WASHINGTON
BEAM: Meson Area - East
STUDY OF THE NUCLEAR ANTIQUARK SEA VIA P+N -> DIMUONS.

Request	11 Mar, 86	Unspecified
Approval	1 Jul, 86	Unspecified
Completed	15 Feb, 88	1,700 Hours

773	ETA00 & ETA+- PHASE DIFFERENCE #773	George D. Gollin	UNIVERSITY OF CHICAGO ELMHURST COLLEGE FERMILAB UNIVERSITY OF ILLINOIS, CHAMPAIGN RUTGERS UNIVERSITY
	BEAM: Meson Area - Center MEASUREMENT OF PHASE DIFFERENCE BETWEEN ETA 00 AND ETA +- TO A PRECISION OF 1/2 DEGREE.		
	Request 11 Mar, 86 Unspecified Approval 1 Jul, 86 Unspecified 29 Jun, 89 Unspecified Stage II approval. Completed 30 Sep, 91 Unspecified		
774	ELECTRON BEAM DUMP #774	Michael B. Crisler	FERMILAB UNIVERSITY OF ILLINOIS, CHAMPAIGN INP, KRAKOW (POLAND) NORTHEASTERN UNIVERSITY
	BEAM: Proton Area - Broad Band ELECTRON BEAM DUMP PARTICLE SEARCH IN THE WIDE BAND HALL.		
	Request 4 Apr, 86 Unspecified Approval 10 Dec, 86 Unspecified Completed 27 Aug, 90 Unspecified		
775	CDF UPGRADE #775	William C. Carithers, Jr. and Giorgio Bellettini	IHEP, ACADEMIA SINICA (TAIWAN) ARGONNE NATIONAL LABORATORY UNIVERSITY OF BOLOGNA (ITALY) BRANDEIS UNIVERSITY UNIV. OF CALIFORNIA, LOS ANGELES CIPP (CANADA) UNIVERSITY OF CHICAGO DUKE UNIVERSITY FERMILAB INFN, FRASCATI (ITALY) HARVARD UNIVERSITY HIROSHIMA UNIVERSITY (JAPAN) UNIVERSITY OF ILLINOIS, CHAMPAIGN JOHNS HOPKINS UNIVERSITY KEK (JAPAN) LAWRENCE BERKELEY LABORATORY MASSACHUSETTS INST. OF TECHNOLOGY UNIVERSITY OF MICHIGAN - ANN ARBOR MICHIGAN STATE UNIVERSITY UNIVERSITY OF NEW MEXICO OSAKA CITY UNIVERSITY (JAPAN) UNIVERSITY OF PADOVA (ITALY) UNIVERSITY OF PENNSYLVANIA INFN, PISA (ITALY) UNIVERSITY OF PITTSBURGH PURDUE UNIVERSITY UNIVERSITY OF ROCHESTER ROCKEFELLER UNIVERSITY RUTGERS UNIVERSITY TEXAS A&M UNIVERSITY TEXAS TECH UNIVERSITY UNIVERSITY OF TSUKUBA (JAPAN) TUFTS UNIVERSITY WASEDA UNIVERSITY (JAPAN) UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY
	BEAM: Collision Area (B-0) CDF UPGRADE (Level-3 Trigger; Silicon Vertex (#775A); and Muon System (#775B))		
	Request 28 May, 86 Unspecified Approval 1 Jul, 86 Unspecified Phase I approval. Data Analysis 20 Feb, 96		
776	NUCLEAR CAL. CROSS SECTIONS#776	Samuel I. Baker	BROOKHAVEN NATIONAL LABORATORY CERN (SWITZERLAND) FERMILAB
	BEAM: Miscellaneous Area MEASUREMENT OF NUCLEAR CALIBRATION CROSS SECTIONS FOR PROTONS GREATER THAN 400 GEV.		
	Request 6 Aug, 86 Unspecified Approval 7 Jan, 87 Unspecified Completed 15 Feb, 88 Unspecified		
777	MR TUNNEL NEUTRONS #777	Joseph B. McCaslin	FERMILAB LAWRENCE BERKELEY LABORATORY SSC CENTRAL DESIGN GROUP
	BEAM: Collision Area (Miscellaneous) NEUTRON FLUX MEASUREMENTS IN THE TEVATRON TUNNEL.		
	Request 29 Oct, 86 Unspecified Approval 7 Jan, 87 Unspecified Completed 11 May, 87 Unspecified		
778	MAGNET APERTURE STUDIES #778	Rodney E. Gerig and Richard Talman	CERN (SWITZERLAND) CORNELL UNIVERSITY FERMILAB UNIVERSITY OF HOUSTON SSC CENTRAL DESIGN GROUP SLAC
	BEAM: Collision Area (Miscellaneous) STUDY OF THE SSC MAGNET APERTURE CRITERION.		
	Request 18 Oct, 86 Unspecified Approval 10 Dec, 86 Unspecified Completed 21 Jan, 91 Unspecified		
779	HIGH RATE CALORIMETER STUDY#779	David F. Anderson	FERMILAB
	BEAM: Meson Area - West PROPOSAL TO BUILD A VERY HIGH RATE CALORIMETER.		
	Request 29 Oct, 86 Unspecified Rejected 10 Dec, 86		
780	CHARM PRODUCTION BY PROTONS#780	Ronald J. Lipton and Douglas M. Potter	UNIV. OF CALIFORNIA, DAVIS CARNEGIE-MELLON UNIVERSITY UNIVERSITY OF OKLAHOMA
	BEAM: Neutrino Area - East STUDY OF CHARM PRODUCED BY 850 GEV PROTONS.		
	Request 1 Mar, 87 Unspecified Rejected 14 Dec, 87		

781 LARGE-X BARYON SPECTROMETER#781 — James S. Russ
BEAM: Proton Area - Center
SEGMENTED LARGE-X BARYON SPECTROMETER (SELEX).

IHEP, BEIJING (PRC)
BOGAZICI UNIVERSITY (TURKEY)
UNIVERSITY OF BRISTOL (ENGLAND)
CARNEGIE-MELLON UNIVERSITY
CBPF (BRAZIL)
FERMILAB
UNIVERSITY OF HAWAII AT MANOA
UNIVERSITY OF IOWA
MAX-PLANCK INSTITUTE (GERMANY)
MOSCOW STATE UNIVERSITY (RUSSIA)
ITEP, MOSCOW (RUSSIA)
UNIV. FEDERAL DO PARAIBA (BRAZIL)
PNPI, ST. PETERSBURG (RUSSIA)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
UNIVERSITY OF ROCHESTER
INFN, ROME (ITALY)
UN.AUTO.DE SAN LUIS POTOSI(MEXICO)
UNIVERSITE OF SAO PAULO (BRAZIL)
UNIVERSITY OF TEL-AVIV (ISRAEL)
INFN, TRIESTE (ITALY)

Request	4 Mar, 87	Unspecified
Approval	24 Oct, 88	Unspecified
In Progress	20 Feb, 97	
Data Analysis	3 Sep, 97	

782 MUONS IN 1M BUBBLE CHAMBER #782 — Toshio Kitagaki
BEAM: Neutrino Area - NK Beam
A MUON EXPOSURE IN THE TOHOKU HIGH RESOLUTION BUBBLE CHAMBER.

IHEP, BEIJING (PRC)
BROWN UNIVERSITY
FERMILAB
MASSACHUSETTS INST. OF TECHNOLOGY
OAK RIDGE NATIONAL LABORATORY
SENSYU UNIVERSITY (JAPAN)
SUGIYAMA JOGAKUEN UNIV. (JAPAN)
UNIVERSITY OF TENNESSEE, KNOXVILLE
TOHOKU GAKUIN UNIVERSITY (JAPAN)
TOHOKU UNIVERSITY (JAPAN)

Request	4 Feb, 87	Unspecified
Approval	16 Jul, 87	Unspecified
Completed	21 Jul, 90	330 K Pix

783 TEVATRON BEAUTY FACTORY #783 — Neville W. Reay
BEAM: Collision Area (C-0)
LETTER OF INTENT FOR A TEVATRON COLLIDER BEAUTY FACTORY.

UNIV. OF CALIFORNIA, DAVIS
CARNEGIE-MELLON UNIVERSITY
FERMILAB
OHIO STATE UNIVERSITY
UNIVERSITY OF OKLAHOMA

Request	4 Mar, 87	Unspecified
Inactive	23 Dec, 92	

784 BOTTOM AT THE COLLIDER #784 — Nigel S. Lockyer
BEAM: Unspecified Beam
PROPOSAL FOR RESEARCH & DEVELOPMENT: VERTEXING, TRACKING AND DATA ACQUISITION FOR THE BOTTOM COLLIDER DETECTOR.

UNIVERSIDAD DE LOS ANDES(COLOMBIA)
UNIV. OF CALIFORNIA, DAVIS
FERMILAB
UNIVERSITY OF FLORIDA
UNIVERSITY OF HOUSTON
ILLINOIS INSTITUTE OF TECHNOLOGY
UNIVERSITY OF IOWA
NORTHEASTERN UNIVERSITY
NORTHERN ILLINOIS UNIVERSITY
OHIO STATE UNIVERSITY
UNIVERSITY OF OKLAHOMA
UNIVERSITY OF PENNSYLVANIA
PRAIRIE VIEW A&M UNIVERSITY
PRINCETON UNIVERSITY
UNIV. OF PUERTO RICO - RIO PIEDRAS
UN.SAN FRANCISCO DE QUITO(ECUADOR)
YALE UNIVERSITY

Request	2 Jan, 89	Unspecified	
Approval	30 Jan, 89	Unspecified	Approval of Phase I (bench tests) and Phase II (beam tests). Phase III (C0 run at the Tevatron Collider) deferred pending results of simulation studies.
Completed	8 Jan, 92	Unspecified	

785 LOW ENERGY ANTIMATTER #785 — Billy Bonner and Lawrence Pinsky
BEAM: Miscellaneous Area
ANTIMATTER PHYSICS AT LOW ENERGY (AMPLE)

UNIVERSITY OF HOUSTON
RICE UNIVERSITY

Request	12 Mar, 87	Unspecified
Withdrawn	24 Oct, 88	

786 TEVATRON MUON #786 — Richard Wilson
BEAM: Neutrino Area - Muon Beam
WEAK INTERACTIONS AND HEAVY QUARK PHYSICS WITH THE TEVATRON MUON BEAM.

ARGONNE NATIONAL LABORATORY
UNIV. OF CALIFORNIA, SAN DIEGO
FERMILAB
FREIBURG UNIVERSITY (GERMANY)
HARVARD UNIVERSITY
UNIV. OF ILLINOIS, CHICAGO CIRCLE
INP, KRAKOW (POLAND)
UNIVERSITY OF MARYLAND
MASSACHUSETTS INST. OF TECHNOLOGY
MAX-PLANCK INSTITUTE (GERMANY)
UNIVERSITY OF WASHINGTON
UNIVERSITY OF WUPPERTAL (GERMANY)
YALE UNIVERSITY

Request	10 May, 87	Unspecified
Rejected	29 Jun, 88	

787 PARTICLE SEARCH #787 — Alfred T. Goshaw
BEAM: Collision Area (C-0)
PARTICLE SEARCH (PHASE II OF E-735).

DEPAUW UNIVERSITY
DUKE UNIVERSITY
FERMILAB
IOWA STATE UNIVERSITY
NOTRE DAME UNIVERSITY
PURDUE UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON

Request	30 Jun, 87	Unspecified
Rejected	1 May, 89	

788 NEUTRINO OSCILLATIONS #788 — Robert H. Bernstein
FERMILAB
UNIV. OF PARIS VI, LPG (FRANCE)
BEAM: Neutrino Area - Center
NEUTRINO OSCILLATIONS AND CROSS-SECTIONS IN A TAGGED NEUTRINO LINE.

Request	11 Aug, 87	Unspecified
Inactive	23 Dec, 92	

789 B-QUARK MESONS & BARYONS #789 — Daniel M. Kaplan and Jen-Chieh Peng
ABILENE CHRISTIAN UNIVERSITY
IHEP, ACADEMIA SINICA (TAIWAN)
UNIVERSITY OF CHICAGO
FERMILAB
LAWRENCE BERKELEY LABORATORY
LOS ALAMOS NATIONAL LABORATORY
NORTHERN ILLINOIS UNIVERSITY
UNIVERSITY OF SOUTH CAROLINA
BEAM: Meson Area - East
MEASUREMENT OF THE PRODUCTION AND DECAY INTO TWO-BODY MODES OF B-QUARK MESONS AND BARYONS.

Request	9 Nov, 87	Unspecified
Approval	24 Oct, 88	Unspecified
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

790 CALORIMETER FOR ZEUS #790 — Frank J. Sciulli
ARGONNE NATIONAL LABORATORY
COLUMBIA UNIVERSITY
UNIVERSITY OF IOWA
LOUISIANA STATE UNIVERSITY
OHIO STATE UNIVERSITY
PENNSYLVANIA STATE UNIVERSITY
VIRGINIA TECH
UNIVERSITY OF WISCONSIN - MADISON
BEAM: Neutrino Area - Test Beam
CALORIMETER MODULE CALIBRATION FOR ZEUS DETECTOR.

Request	5 Jun, 87	Unspecified
Approval	17 Dec, 87	Unspecified
Completed	27 Aug, 90	Unspecified

791 HADROPRODUCTION HEAVY FLAVORS #791 — Jeffrey A. Appel and Milind Vasant Purohit
UNIV. OF CALIFORNIA, SANTA CRUZ
CBPF (BRAZIL)
UNIVERSITY OF CINCINNATI
CINVESTAV-IPN (MEXICO)
FERMILAB
ILLINOIS INSTITUTE OF TECHNOLOGY
KANSAS STATE UNIVERSITY
UNIVERSITY OF MISSISSIPPI
OHIO STATE UNIVERSITY
PRINCETON UNIVERSITY
UN.AUTONOMA DE PUEBLA (MEXICO)
UNIV. FEDERAL DO RIO DE JANEIRO
UNIVERSITY OF SOUTH CAROLINA
STANFORD UNIVERSITY
UNIVERSITY OF TEL-AVIV (ISRAEL)
TUFTS UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY
BEAM: Proton Area - East
Search for the Flavor-Changing Neutral-Current Decays

Request	10 Nov, 87	Unspecified
Approval	29 Jun, 88	Unspecified
Data Analysis	8 Jan, 92	Unspecified
Completed	1 Mar, 99	Unspecified

792 NUCLEAR FRAGMENTS #792 — Kjell Aleklett and Lembit Sihver
LAL, ORSAY (FRANCE)
UPPSALA UNIVERSITY (SWEDEN)
BEAM: Meson Area - East
STUDY OF FRAGMENTATION PRODUCTS FROM THE REACTION 800 GEV P + 197 AU.

Request	15 Jan, 88	Unspecified
Approval	15 Jan, 88	Unspecified
Completed	15 Feb, 88	Unspecified

793 EMULSION EXPOSURE 1000 GeV #793 — Jere J. Lord
KAZAKH STATE UNIV., (KAZAKHSTAN)
WASHINGTON NATURAL PHILOSOPHY INS.
UNIVERSITY OF WASHINGTON
BEAM: Proton Area - Miscellaneous
Emulsion Exposure to 1000 GeV, or highest energy protons.

Request	19 Feb, 88	Unspecified
Approval	21 Sep, 88	Unspecified
Approved/Inactive	13 Jan, 94	

794 AXION HELIOSCOPE #794 — Karl Van Bibber
UNIV. OF CALIFORNIA, BERKELEY
CERN (SWITZERLAND)
LAWRENCE BERKELEY LABORATORY
LAWRENCE LIVERMORE LABORATORY
OHIO STATE UNIVERSITY
TEXAS A&M UNIVERSITY
TEXAS ACCELERATOR CENTER
BEAM: Unspecified Beam
CONSTRUCTION AND OPERATION OF AN AXION HELIOSCOPE.

Request	5 Mar, 88	Unspecified
Inactive	23 Dec, 92	

795 WARM LIQUID CALORIMETRY TEST #795 — Morris Pripstein
UNIVERSITY OF ALABAMA
UNIV. OF CALIFORNIA, BERKELEY
CEN-SACLAY (FRANCE)
CERN (SWITZERLAND)
FERMILAB
COLLEGE DE FRANCE (FRANCE)
HARVARD UNIVERSITY
KYOTO UNIVERSITY (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
LAWRENCE BERKELEY LABORATORY
BEAM: Meson Area - Test Beam
TEST OF ELECTRON/HADRON COMPENSATION FOR WARM LIQUID CALORIMETRY.

Request	1 Mar, 88	Unspecified
Approval	24 Oct, 88	Unspecified
Completed	23 Dec, 91	Unspecified

796 CP VIOLATION #796 — Gordon B. Thomson
UNIVERSITY OF MINNESOTA
RUTGERS UNIVERSITY
BEAM: Proton Area - Center
A MEASUREMENT OF THE CP VIOLATION PARAMETER N+-0 THE SON OF E621.

Request	1 Jun, 88	Unspecified
Withdrawn	4 Jan, 94	

797 FINE-GRAINED ELECTROMAG. CAL. #T797 — H. Richard Gustafson and Rudolf P. Thun
UNIVERSITY OF MICHIGAN - ANN ARBOR
BEAM: Proton Area - East
FINE-GRAINED ELECTROMAGNETIC CALORIMETRY.

Request	31 Aug, 88	Unspecified
Approval	1 Apr, 90	Unspecified
Completed	20 May, 90	Unspecified

798 SSC DETECTOR TEST #T798 — Priscilla Cushman and Roger W. Rusack — ROCKEFELLER UNIVERSITY; YALE UNIVERSITY
BEAM: Proton Area - East
PROPOSAL TO BUILD A SYNCHROTRON-RADIATION DETECTOR FOR TAGGING ELECTRONS AT THE SSC.

Request	20 Jul, 88	Unspecified
Approval	30 Jan, 89	Unspecified Stage I approval.
Completed	2 May, 90	Unspecified

799 CP VIOLATION #799 — Anthony Barker — UNIVERSITY OF ARIZONA; UNIV. OF CALIFORNIA, LOS ANGELES; UNIV. OF CALIFORNIA, SAN DIEGO; UNIV. ESTADUAL DE CAMPINAS(BRAZIL); UNIVERSITY OF CHICAGO; UNIVERSITY OF COLORADO AT BOULDER; ELMHURST COLLEGE; FERMILAB; OSAKA UNIVERSITY (JAPAN); RICE UNIVERSITY; RUTGERS UNIVERSITY; UNIVERSITE DE SAO PAULO (BRAZIL); UNIVERSITY OF VIRGINIA; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Neutrino Area - Muon Beam
PROPOSAL TO SEARCH FOR RARE KAON DECAY.

Request	2 Jan, 89	Unspecified
Approval	29 Jun, 89	Unspecified Stage I approval for phases 1 and 2.
	10 Jul, 91	Unspecified Stage II approval deferred.
In Progress	1 Oct, 91	
Data Analysis	17 Jan, 00	

800 MAGNETIC MOMENT #800 — Kenneth A. Johns and Regina A. Rameika — UNIVERSITY OF ARIZONA; DEPAUW UNIVERSITY; FERMILAB; UNIVERSITY OF MICHIGAN - ANN ARBOR; UNIVERSITY OF MINNESOTA
BEAM: Proton Area - Center
MEASUREMENT OF THE MAGNETIC MOMENT OF THE OMEGA MINUS HYPERON.

Request	1 Mar, 88	Unspecified
Approval	5 Oct, 88	Unspecified
Completed	8 Jan, 92	Unspecified

801 PHOTON TOTAL XSECTION-URANIUM #801 — G. L. Bayatian — YEREVAN PHYSICS INST. (ARMENIA)
BEAM: Proton Area - Broad Band
MEASUREMENT OF THE TOTAL CROSS SECTION OF REAL AND VIRTUAL PHOTON ABSORBTION ON URANIUM NUCLEI AT ENERGIES OF HUNDREDS OF GEV.

Request	10 Oct, 88.	Unspecified
Rejected	26 Dec, 89	

802 MUONS IN EMULSION #802 — Lali Chatterjee and Dipak Ghosh — FERMILAB; JADAVPUR UNIVERSITY (INDIA)
BEAM: Neutrino Area - Muon Beam
DEEP INELASTIC MUON INTERACTION WITH NUCLEAR TARGETS USING EMULSION TELESCOPE TECHNIQUE.

Request	12 Dec, 88	Emulsion Stack(s)
Approval	8 Feb, 89	Emulsion Stack(s) 1st stage approval - exposure of stacks of G5 nuclear emulsion plates to the main muon beam.
Completed	30 Dec, 91	Unspecified

803 NEUTRINO OSCILLATIONS #803 — Neville W. Reay — AICHI UNIV. OF EDUCATION (JAPAN); UNIVERSITY OF ATHENS (GREECE); UNIV. OF CALIFORNIA, DAVIS; UNIV. OF CALIFORNIA, LOS ANGELES; CHONNAM NATIONAL UNIVERSITY(KOREA); FERMILAB; GIFU UNIVERSITY (JAPAN); GYEONGSANG NATIONAL UNIV. (KOREA); HIROSAKI UNIVERSITY (JAPAN); ILLINOIS INSTITUTE OF TECHNOLOGY; INDIANA UNIVERSITY; KANSAS STATE UNIVERSITY; KINKI UNIVERSITY (JAPAN); KOBE UNIVERSITY (JAPAN); KOREA ADV. INST OF SCIENCE (KOREA); KOREA UNIVERSITY, SEOUL (KOREA); UNIVERSITY OF MICHIGAN - ANN ARBOR; ITEP, MOSCOW (RUSSIA); NAGOYA INST. OF TECHNOLOGY (JAPAN); OKAYAMA UNIVERSITY (JAPAN); OSAKA CITY UNIVERSITY (JAPAN); OSAKA SCIENCE EDUC. INST. (JAPAN); OSAKA UNIV. OF COMMERCE (JAPAN); SEOUL NATIONAL UNIVERSITY (KOREA); SOAI UNIVERSITY (JAPAN); UNIVERSITY OF SOUTH CAROLINA; TECHNION-ISRAEL INST (ISRAEL); TOHO UNIVERSITY (JAPAN); TUFTS UNIVERSITY; UTSUNOMIYA UNIVERSITY (JAPAN); YOKOHAMA NATIONAL UNIV. (JAPAN)
BEAM: Main Injector Area
Muon Neutrino to Tau Neutrino Oscillations

Request	6 Apr, 89	Unspecified
Unscheduled	24 Nov, 93	
Withdrawn	9 Mar, 98	

804 KAMI R&D #804 — Ronald Ray — UNIVERSITY OF ARIZONA; UNIV. OF CALIFORNIA, LOS ANGELES; UNIV. ESTADUAL DE CAMPINAS(BRAZIL); UNIVERSITY OF CHICAGO; UNIVERSITY OF COLORADO AT BOULDER; FERMILAB; OSAKA UNIVERSITY; IHEP, PROTVINO (SERPUKHOV)(RUSSIA); RICE UNIVERSITY; UNIVERSITE DE SAO PAULO (BRAZIL); UNIVERSITY OF VIRGINIA
BEAM: Main Injector Area
HIGH PRECISION, HIGH SENSITIVITY KAON PHYSICS AT THE MAIN INJECTOR

Request	14 Jun, 88	Unspecified
Unconsidered	14 Jun, 88	
Approval	7 Jul, 99	
In Progress	17 Jan, 00	

805 IMB NEUTRINO OSCILLATIONS #805 — Wojciech Gajewski

BEAM: Main Injector Area

Long Baseline Oscillation Experiment using a High Intensity Neutrino Beam from the Fermilab Main Injector to the IMB Water Cerenkov Detector

BOSTON UNIVERSITY
BROOKHAVEN NATIONAL LABORATORY
UNIV. OF CALIFORNIA, IRVINE
CLEVELAND STATE UNIVERSITY
UNIVERSITY OF HAWAII AT MANOA
LONDON UNIVERSITY COLLEGE(ENGLAND)
LOUISIANA STATE UNIVERSITY
UNIVERSITY OF MARYLAND
NOTRE DAME UNIVERSITY
WARSAW UNIVERSITY, INP, (POLAND)

Request	24 Aug, 89	Unspecified
Inactive	23 Dec, 92	

806 MP BEAMLINE UPGRADE #806 — Akihiko Yokosawa

BEAM: Meson Area - Polarized Proton Beam

ENERGY UPGRADE OF THE MP BEAMLINE AND PROPOSED EXPERIMENTS

ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
FERMILAB
HIROSHIMA UNIVERSITY (JAPAN)
UNIVERSITY OF IOWA
KEK (JAPAN)
KYOTO SANGYO UNIVERSITY (JAPAN)
KYOTO UNIVERSITY (JAPAN)
KYOTO UNIV. OF EDUCATION (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
LOS ALAMOS NATIONAL LABORATORY
NORTHEASTERN UNIVERSITY
NORTHWESTERN UNIVERSITY
UN. OF OCCUP. & ENV. HEALTH(JAPAN)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)
UNIVERSITY OF UDINE (ITALY)

Request	28 Sep, 89	Unspecified
Withdrawn	7 Mar, 90	

807 WARM HEAVY LIQUID CALORIMETRY #T807 — Scott Teige

BEAM: Proton Area - East

WARM HEAVY LIQUID CALORIMETRY: A PROPOSAL TO MEASURE PERFORMANCE OF CANDIDATE MATERIALS

RUTGERS UNIVERSITY

Request	26 Dec, 89	Unspecified
Approval	9 Feb, 90	Unspecified
Completed	1 May, 90	Unspecified

808 B-PHYSICS #T808 — Howard S. Goldberg

BEAM: Meson Area - West

B-MESON HADROPRODUCTION, INCLUDING MEASUREMENTS OF CROSS-SECTIONS, LIFETIMES, AND MIXING.

UNIV. OF ILLINOIS, CHICAGO CIRCLE
UNIVERSITY OF LOUISVILLE
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF PITTSBURGH
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)

Request	1 Mar, 90	Unspecified
Inactive	23 Dec, 92	

809 DIRECT PHOTON SPIN DEPENDENCE #809 — Akira Masaike and Sandibek B. (Sergei) Nurushev

BEAM: Meson Area - Polarized Proton Beam

STUDY OF THE SPIN DEPENDENCE OF DIRECT-GAMMA PRODUCTION AT HIGH P

ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
FERMILAB
UNIVERSITY OF IOWA
KEK (JAPAN)
KYOTO SANGYO UNIVERSITY (JAPAN)
KYOTO UNIVERSITY (JAPAN)
KYOTO UNIV. OF EDUCATION (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
LOS ALAMOS NATIONAL LABORATORY
INFN, MESSINA (ITALY)
NEW MEXICO STATE UNIVERSITY
NORTHWESTERN UNIVERSITY
OKAYAMA UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)
UNIVERSITY OF UDINE (ITALY)

Request	7 Mar, 90	Unspecified
Inactive	23 Dec, 92	

810 STRUCTURE FUNCTIONS #810 — Richard Wilson

BEAM: Neutrino Area - Muon Beam

MEASUREMENT OF NUCLEON STRUCTURE FUNCTIONS WITH HIGH STATISTICAL ACCURACY AND LOW SYSTEMATIC ERRORS, USING MUON BEAMS FROM THE TEVATRON.

UNIV. OF CALIFORNIA, SAN DIEGO
FERMILAB
HARVARD UNIVERSITY
UNIV. OF ILLINOIS, CHICAGO CIRCLE
UNIVERSITY OF WUPPERTAL (GERMANY)

Request	5 Mar, 90	Unspecified
Inactive	23 Dec, 92	

811 PBAR P ELASTIC SCATTERING #811 — Jay Orear

BEAM: Collision Area (E-0)

PBAR P ELASTIC SCATTERING.

CERN (SWITZERLAND)
CORNELL UNIVERSITY
FERMILAB

Request	14 Mar, 90	Unspecified
Approval	9 Jul, 92	Unspecified
Data Analysis	20 Feb, 96	
Completed	1 Mar, 01	

812 CPT AND GRAVITY TESTS #812 — Gerald A. Smith

BEAM: Accumulator Ring

PRECISION TESTS OF CPT AND GRAVITY USING LOW ENERGY ANTIMATTER AT FERMILAB.

UNIV. OF CALIFORNIA, IRVINE
GSI, DARMSTADT (GERMANY)
FERMILAB
INTEGRATED ACCELERATOR TECHNOLOGY
UNIVERSITY OF IOWA
LOS ALAMOS NATIONAL LABORATORY
MANNE SIEGBAHN INSTITUTE (SWEDEN)
MAX-PLANCK INSTITUTE (GERMANY)
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF NEW MEXICO
PENNSYLVANIA STATE UNIVERSITY
RUTGERS UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)

Request	19 Feb, 90	Unspecified
Inactive	30 Jun, 94	

813	SMALL PHYSICS #813	Lawrence W. Jones	UNIVERSITY OF HAWAII AT MANOA
	BEAM: Unspecified Beam		LODZ UNIVERSITY
	I. A QUANTITATIVE TEST OF THE LANDAU-MIGDAL-POMMERANCHUK EFFECT; II. HADRON INCLUSIVE DISTRIBUTIONS AT HIGH X; III. NEUTRON POLARIZATION		UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF WASHINGTON

Request	2 Mar, 90	Unspecified
Rejected	5 May, 93	

814	PRIMAKOFF PRODUCTION #814	Vladimir Chaloupka	UNIVERSITY OF ROCHESTER
	BEAM: Proton Area - Center		UNIVERSITY OF WASHINGTON
	SEARCH FOR PRIMAKOFF PRODUCTION OF HYBRID MESONS.		

Request	28 Feb, 90	Unspecified
Inactive	23 Dec, 92	

815	NEUTRINO #815	Michael H. Shaevitz and Robert H. Bernstein	UNIVERSITY OF CINCINNATI
	BEAM: Neutrino Area - Center		COLUMBIA UNIVERSITY
	Precision Measurements of Neutrino Neutral Current Interactions Using a Sign-Selected Beam		FERMILAB KANSAS STATE UNIVERSITY NORTHWESTERN UNIVERSITY UNIVERSITY OF OREGON UNIVERSITY OF ROCHESTER XAVIER UNIVERSITY

Request	7 Mar, 90	Unspecified	
	9 Oct, 90	Unspecified	
Approval	10 Jul, 91	Unspecified	Stage I approval for Phase I granted.
	9 Jul, 92	Unspecified	Stage I approval for 10 E18th Protons on target
	24 Jun, 94	Unspecified	1E18 protons on target at an intensity between 1 and 3 E13 protons / pulse
In Progress	15 Jun, 96		
Data Analysis	5 Sep, 97		

816	SDC DETECTOR MUON BEAM TESTS #T816	Henry J. Lubatti	UNIVERSITY OF COLORADO AT BOULDER
	BEAM: Neutrino Area - Muon Beam		FERMILAB
	SSC Detector Muon Sub-System Beam Tests		UNIVERSITY OF ILLINOIS, CHAMPAIGN UNIVERSITY OF MARYLAND OSAKA CITY UNIVERSITY (JAPAN) UNIVERSITY OF ROCHESTER TEMPLE UNIVERSITY TUFTS UNIVERSITY UNIVERSITY OF WASHINGTON UNIVERSITY OF WISCONSIN - MADISON

Request	1 May, 90	Unspecified
Approval	30 Oct, 90	Unspecified
Completed	8 Jan, 92	Unspecified

817	SILICON STRIP DETECTOR TEST #817	James P. Alexander	UNIV. OF CALIFORNIA, SANTA BARBARA
	BEAM: Neutrino Area - Muon Beam		CORNELL UNIVERSITY
	Double-sided silicon strip detector prototype evaluation.		

Request	1 May, 90	Unspecified
Approval	9 Jul, 90	Unspecified
Completed	15 Aug, 90	Unspecified

818	LEAD GLASS DETECTOR TEST #818	Scott Teige	INDIANA UNIVERSITY
	BEAM: Unspecified Beam		UNIVERSITY OF LOUISVILLE
	Proposal to use the NWA Electron Test Beam at Fermilab for Tests of a Lead Glass Calorimeter Prototype		MOSCOW STATE UNIVERSITY (RUSSIA) IHEP, PROTVINO (SERPUKHOV)(RUSSIA)

Request	26 Jun, 90	Unspecified
Withdrawn	30 Apr, 91	

819	EMPACT DETECTOR TEST FOR SSC #819	Louis S. Osborne	UNIVERSITY OF HOUSTON
	BEAM: Neutrino Area - Muon Beam		INDIANA UNIVERSITY
	EMPACT Muon Telescope Evaluation at Fermilab		JINR, DUBNA (RUSSIA) MASSACHUSETTS INST. OF TECHNOLOGY

Request	28 Jun, 90	Unspecified
Approval	15 Aug, 91	Unspecified
Completed	15 Oct, 91	Unspecified

820	MUON NEUTRINO MAGNETIC MOMENT #820	Nikos D. Giokaris	FERMILAB
	BEAM: Miscellaneous Area		UNIVERSITY OF MARYLAND
	Search for the muon neutrino magnetic moment at the 10 to the -10 Bohr magneton level using the Booster at Fermilab		NORTHEASTERN UNIVERSITY NORTHERN ILLINOIS UNIVERSITY UNIVERSITY OF ROCHESTER ROCKEFELLER UNIVERSITY

Request	13 Jul, 90	Unspecified
Inactive	30 Jun, 94	

821	NEUTRON MEASUREMENTS AT NWA #T821	Kenneth A. Johns	UNIVERSITY OF ARIZONA
	BEAM: Neutrino Area - West		BALL STATE UNIVERSITY
	Neutron Measurements at NWA		FERMILAB UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF MINNESOTA NORTHERN ILLINOIS UNIVERSITY RICE UNIVERSITY

Request	14 Aug, 90	Unspecified
Approval	14 Aug, 90	Unspecified
Completed	8 Jan, 92	Unspecified

822	NEUTRINO OSCILLATIONS #822	Maury C. Goodman	ARGONNE NATIONAL LABORATORY
	BEAM: Main Injector Area		FERMILAB
	A Long-Baseline Neutrino Oscillation Experiment from Fermilab to Soudan		LEBEDEV PHYSICAL INST. (RUSSIA) UNIVERSITY OF MINNESOTA ITEP, MOSCOW (RUSSIA) UNIVERSITY OF OXFORD (ENGLAND) RUTHERFORD-APPLETON LABS.(ENGLAND) SSC LABORATORY TEXAS A&M UNIVERSITY TUFTS UNIVERSITY WESTERN WASHINGTON UNIVERSITY

Request	24 Aug, 90	Unspecified
Withdrawn	24 Oct, 95	

823 D-0 DETECTOR UPGRADE #823 — Hendrik J. Weerts and William J. Womersley

BEAM: Collision Area (D-0)
D0 Detector Upgrade

INST.OF PHYS.ACADEMY OF SCI(CZECH)
UNIV. OF AMSTERDAM (NETHERLANDS)
UNIVERSIDAD DE LOS ANDES(COLOMBIA)
UNIVERSITY OF ARIZONA
IHEP, BEIJING (PRC)
BOSTON UNIVERSITY
BROOKHAVEN NATIONAL LABORATORY
BROWN UNIVERSITY
UNIVERSIDAD DE BUENOS AIRES
CALIFORNIA STATE UNIVERSITY
UNIV. OF CALIFORNIA, IRVINE
UNIV. OF CALIFORNIA, RIVERSIDE
CBPF (BRAZIL)
CEA-SACLAY (FRANCE)
CPPM, MARSEILLE (FRANCE)
CHARLES UNIVERSITY (CZECH)
CINVESTAV-IPN (MEXICO)
COLUMBIA UNIVERSITY
CZECH TECHNICAL UNIVERSITY (CZECH)
DELHI UNIVERSITY (INDIA)
FERMILAB
FLORIDA STATE UNIVERSITY
UNIV. OF ILLINOIS, CHICAGO CIRCLE
IMPERIAL COLLEGE (ENGLAND)
INDIANA UNIVERSITY
ISN (GRENOBLE, FRANCE)
IOWA STATE UNIVERSITY
JINR, DUBNA (RUSSIA)
KANSAS STATE UNIVERSITY
UNIVERSITY OF KANSAS
INP, KRAKOW (POLAND)
LAL, ORSAY (FRANCE)
LANCASTER UNIVERSITY
LANGSTON UNIVERSITY
LAWRENCE BERKELEY LABORATORY
LOUISIANA TECH UNIVERSITY
LPNHE, UN. OF P & M CURIE (FRANCE)
LUDWIG MAXIMILIANS UNIV.(GERMANY)
UNIVERSITY OF MAINZ (GERMANY)
UNIVERSITY OF MANCHESTER (ENGLAND)
UNIVERSITY OF MARYLAND
UNIVERSITY OF MICHIGAN - ANN ARBOR
MICHIGAN STATE UNIVERSITY
MOSCOW STATE UNIVERSITY (RUSSIA)
ITEP, MOSCOW (RUSSIA)
UNIVERSITY OF NEBRASKA
SUNY AT STONY BROOK
NIJMEGEN UNIVERSITY (NETHERLANDS)
NIKHEF-H, AMSTERDAM (NETHERLANDS)
NORTHEASTERN UNIVERSITY
NORTHERN ILLINOIS UNIVERSITY
NORTHWESTERN UNIVERSITY
NOTRE DAME UNIVERSITY
UNIVERSITY OF OKLAHOMA
PANJAB UNIVERSITY (INDIA)
PAULISTA, UNIV. ESTADUAL, (BRAZIL)
PNPI, ST. PETERSBURG (RUSSIA)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIV. FEDERAL DO RIO DE JANEIRO
UNIVERSITY OF ROCHESTER
UN.SAN FRANCISCO DE QUITO(ECUADOR)
TATA INSTITUTE (INDIA)
UNIVERSITY OF TEXAS AT ARLINGTON
UNIVERSITY OF VIRGINIA
UNIVERSITY OF WASHINGTON

Request	4 Oct, 90	Unspecified
Approval	11 Jul, 91	Unspecified Stage I / Step 1 approval granted.
		Stage I / Step 2 and 3 approval deferred.
Unscheduled	11 Jul, 91	
Setup in a Year	1 Mar, 99	

824 DUMAND NEUTRINO OSCILLATIONS #824 — Medford S. Webster

BEAM: Main Injector Area
Neutrino Beam from the Proposed Main Injector to the DUMAND Detector

RWTH, AACHEN (GERMANY)
UNIVERSITY OF BERNE (SWITZERLAND)
BOSTON UNIVERSITY
UNIVERSITY OF HAWAII AT MANOA
ICRR, UNIVERSITY OF TOKYO (JAPAN)
UNIVERSITY OF KIEL (GERMANY)
KINKI UNIVERSITY (JAPAN)
KOBE UNIVERSITY (JAPAN)
SCRIPPS INST. OF OCEANOGRAPHY/UCSD
TOHOKU UNIVERSITY (JAPAN)
VANDERBILT UNIVERSITY
UNIVERSITY OF WASHINGTON
UNIVERSITY OF WISCONSIN - MADISON

Request	4 Oct, 90	Unspecified
Inactive	23 Dec, 92	

825 SDC PROTOTYPE DETECTORS #825 James R. Bensinger

BEAM: Unspecified Beam

Testing of Prototype Detectors for the Solenoidal Detector Collaboration

ARGONNE NATIONAL LABORATORY
UNIVERSITY OF ARIZONA
BRANDEIS UNIVERSITY
BRATSLAVA STATE UNIVERSITY (CZECH)
UNIVERSITY OF BRISTOL (ENGLAND)
BROWN UNIVERSITY
UNIV. OF CALIFORNIA, DAVIS
UNIV. OF CALIFORNIA, LOS ANGELES
UNIV. OF CALIFORNIA, RIVERSIDE
UNIV. OF CALIFORNIA, SAN DIEGO
UNIV. OF CALIFORNIA, SANTA CRUZ
CHIBA UNIVERSITY (JAPAN)
UNIVERSITY OF CHICAGO
UNIVERSITY OF COLORADO AT BOULDER
DUKE UNIVERSITY
FERMILAB
FLORIDA STATE UNIVERSITY
UNIVERSITY OF FLORIDA
FUKUI UNIVERSITY (JAPAN)
GOMEL STATE UNIVERSITY (BYELARUS)
HARVARD UNIVERSITY
UNIVERSITY OF HAWAII AT MANOA
HIROSHIMA INST. OF TECH. (JAPAN)
HIROSHIMA UNIVERSITY (JAPAN)
IBARAKI COLLEGE OF TECH. (JAPAN)
UNIV. OF ILLINOIS, CHICAGO CIRCLE
UNIVERSITY OF ILLINOIS, CHAMPAIGN
INDIANA UNIVERSITY
IOWA STATE UNIVERSITY
JINR, DUBNA (RUSSIA)
JOHNS HOPKINS UNIVERSITY
KEK (JAPAN)
KYOTO UNIVERSITY (JAPAN)
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF LIVERPOOL (ENGLAND)
UNIVERSITY OF MARYLAND
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF MINNESOTA
ACADEMY OF SCI. OF BSSR (BYELARUS)
UNIVERSITY OF MISSISSIPPI
MIYAZAKI UNIVERSITY (JAPAN)
NAGOYA UNIVERSITY (JAPAN)
NIIGATA UNIVERSITY (JAPAN)
NOTRE DAME UNIVERSITY
OAK RIDGE NATIONAL LABORATORY
OHIO STATE UNIVERSITY
OKAYAMA UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
OSAKA UNIVERSITY (JAPAN)
UNIVERSITY OF OXFORD (ENGLAND)
PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY OF PENNSYLVANIA
UNIVERSITY OF PISA (ITALY)
UNIVERSITY OF PITTSBURGH
PURDUE UNIVERSITY
RICE UNIVERSITY
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY
RUTGERS UNIVERSITY
RUTHERFORD-APPLETON LABS.(ENGLAND)
SAGA UNIVERSITY (JAPAN)
SAITAMA COLLEGE OF HEALTH (JAPAN)
SLOVAK ACADEMY OF SCIENCE (CZECH)
SOFIA STATE UNIVERSITY (BULGARIA)
SSC LABORATORY
SLAC
TASHKENT, PHY.TEC.INS (UZBEKISTAN)
IHEP, TBILISI STATE UNIV (GEORGIA)
TEXAS A&M UNIVERSITY
UNIVERSITY OF TEXAS AT DALLAS
TOHOKU GAKUIN UNIVERSITY (JAPAN)
TOHOKU UNIVERSITY (JAPAN)
TOKYO INST. OF TECHNOLOGY (JAPAN)
TOKYO METROPOLITAN UNIV. (JAPAN)
TOKYO UNIV. OF AGR. & TECH.(JAPAN)
UNIVERSITY OF TOKYO (JAPAN)
UNIVERSITY OF TSUKUBA (JAPAN)
TUFTS UNIVERSITY
VIRGINIA TECH
WAKAYAMA MEDICAL COLLEGE (JAPAN)
UNIVERSITY OF WASHINGTON
UNIVERSITY OF WISCONSIN - MADISON
YEREVAN PHYSICS INST. (ARMENIA)

Request	1 Oct, 90 Unspecified
Inactive	23 Dec, 92

826 HYPERON MEASUREMENTS #826 Kenneth A. Johns and Regina A. Rameika

BEAM: Proton Area - Center

An Expression of Interest to Continue Hyperon Measurements at Fermilab

UNIVERSITY OF ARIZONA
FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF MINNESOTA

Request	8 Oct, 90 Unspecified
Inactive	23 Dec, 92

827 MICRO-BCD #827 — Nigel S. Lockyer
BEAM: Collision Area (C-0)
B Physics at the TEV I; Micro-BCD

UNIVERSIDAD DE LOS ANDES(COLOMBIA)
UNIV. OF CALIFORNIA, DAVIS
FERMILAB
UNIVERSITY OF FLORIDA
UNIV. OF ILLINOIS, CHICAGO CIRCLE
ILLINOIS INSTITUTE OF TECHNOLOGY
UNIVERSITY OF IOWA
UNIVERSITY OF MONTREAL (CANADA)
SUNY AT ALBANY
OAK RIDGE NATIONAL LABORATORY
UNIVERSITY OF OKLAHOMA
UNIVERSITY OF PENNSYLVANIA
PRAIRIE VIEW A&M UNIVERSITY
PRINCETON UNIVERSITY
UNIV. OF PUERTO RICO - RIO PIEDRAS
UN.SAN FRANCISCO DE QUITO(ECUADOR)
SPACE SCIENCE LAB., U.C., BERKELEY
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY

Request	8 Oct, 90	Unspecified
Rejected	10 Jul, 91	

828 B-MESON CP VIOLATION #828 — Sheldon L. Stone
BEAM: Collision Area (Miscellaneous)
Letter of Intent to Measure CP Violation in B Meson Decay at the Fermilab Collider

FERMILAB
UNIVERSITY OF FLORIDA
UNIVERSITY OF MICHIGAN - ANN ARBOR
SYRACUSE UNIVERSITY

Request	26 Sep, 90	Unspecified
Withdrawn	22 Jun, 91	

829 HEAVY FLAVORS AT TPL #829 — David C. Christian and Michael D. Sokoloff
BEAM: Proton Area - East
Study of Heavy Flavors at TPL, Continuation of E-791

UNIVERSITY OF CINCINNATI
CINVESTAV-IPN (MEXICO)
FERMILAB
ILLINOIS INSTITUTE OF TECHNOLOGY
UNIVERSITY OF MASSACHUSETTS
PRINCETON UNIVERSITY
UN.AUTONOMA DE PUEBLA (MEXICO)
UNIVERSITY OF TEL-AVIV (ISRAEL)
TUFTS UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY

Request	8 Oct, 90	Unspecified
Rejected	28 Feb, 94	

830 CDF UPGRADE #830 — Franco Bedeschi and Alfred Goshaw
BEAM: Collision Area (B-0)
Proposal for an Upgraded CDF Detector

IHEP, ACADEMIA SINICA (TAIWAN)
ARGONNE NATIONAL LABORATORY
UNIVERSITY OF BOLOGNA (ITALY)
BRANDEIS UNIVERSITY
UNIV. OF CALIFORNIA, DAVIS
UNIV. OF CALIFORNIA, LOS ANGELES
CIPP (CANADA)
UNIVERSITY OF CANTABRIA (SPAIN)
CARNEGIE-MELLON UNIVERSITY
UNIVERSITY OF CHICAGO
DUKE UNIVERSITY
FERMILAB
UNIVERSITY OF FLORIDA
INFN, FRASCATI (ITALY)
UNIVERSITY OF GENEVA (SWITZERLAND)
GLASGOW UNIVERSITY (SCOTLAND)
HARVARD UNIVERSITY
HIROSHIMA UNIVERSITY (JAPAN)
UNIVERSITY OF ILLINOIS, CHAMPAIGN
INFN, TRIESTE/UNIV.DI UDINE(ITALY)
JINR, DUBNA (RUSSIA)
JOHNS HOPKINS UNIVERSITY
UNIVERSITY OF KARLSRUHNE (GERMANY)
KEK (JAPAN)
KYUNGPOOK NATIONAL UNIV. (KOREA)
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF LIVERPOOL (ENGLAND)
UNIVERSITY COLLEGE LONDON(ENGLAND)
MASSACHUSETTS INST. OF TECHNOLOGY
UNIVERSITY OF MICHIGAN - ANN ARBOR
MICHIGAN STATE UNIVERSITY
ITEP, MOSCOW (RUSSIA)
UNIVERSITY OF NEW MEXICO
NORTHWESTERN UNIVERSITY
OHIO STATE UNIVERSITY
OKAYAMA UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
UNIVERSITY OF OXFORD (ENGLAND)
UNIVERSITY OF PADOVA (ITALY)
UNIVERSITY OF PENNSYLVANIA
INFN, PISA (ITALY)
UNIVERSITY OF PITTSBURGH
PURDUE UNIVERSITY
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY
UNIVERSITY OF ROME (ITALY)
RUTGERS UNIVERSITY
TEXAS A&M UNIVERSITY
TEXAS TECH UNIVERSITY
UNIVERSITY OF TSUKUBA (JAPAN)
TUFTS UNIVERSITY
WASEDA UNIVERSITY (JAPAN)
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY

Request	9 Oct, 90	Unspecified
Unscheduled	11 Jul, 91	
Setup in a Year	1 Mar, 99	

831 HEAVY QUARK PHOTOPRODUCTION #831 — John P. Cumalat and Luigi Moroni

BEAM: Proton Area - Broad Band

A High Statistics Study of States Containing Heavy Quarks Using the Wideband Photon Beam and the E687 Multiparticle Spectrometer

UNIV. OF CALIFORNIA, DAVIS
CBPF (BRAZIL)
CINVESTAV-IPN (MEXICO)
UNIVERSITY OF COLORADO AT BOULDER
FERMILAB
INFN, FRASCATI (ITALY)
UNIVERSITY OF ILLINOIS, CHAMPAIGN
KOREA UNIVERSITY, SEOUL (KOREA)
INFN, MILANO (ITALY)
UNIVERSITY OF MILANO (ITALY)
UNIVERSITY OF NORTH CAROLINA
UNIVERSITY OF PAVIA (ITALY)
UN.AUTONOMA DE PUEBLA (MEXICO)
UNIV. OF PUERTO RICO - MAYAGUEZ
UNIVERSITY OF SOUTH CAROLINA
UNIVERSITY OF TENNESSEE, KNOXVILLE
VANDERBILT UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON
YEONSEI UNIVERSITY (KOREA)

Request	17 Oct, 90	Unspecified
	1 Sep, 92	5,000 Hours 1000 hours for setup and 4000 hours for data taking
Approval	7 Dec, 92	Unspecified
In Progress	15 Sep, 96	
Data Analysis	25 Aug, 97	

832 CP VIOLATION #832 — Edward C. Blucher

BEAM: Neutrino Area - Muon Beam

Proposal for a New Tevatron Search for Direct CP Violation in the 2pi decays of the Neutral Kaon

UNIVERSITY OF ARIZONA
UNIV. OF CALIFORNIA, LOS ANGELES
UNIV. OF CALIFORNIA, SAN DIEGO
UNIV. ESTADUAL DE CAMPINAS(BRAZIL)
UNIVERSITY OF CHICAGO
UNIVERSITY OF COLORADO AT BOULDER
ELMHURST COLLEGE
FERMILAB
OSAKA UNIVERSITY (JAPAN)
RICE UNIVERSITY
RUTGERS UNIVERSITY
UNIVERSITE DE SAO PAULO (BRAZIL)
UNIVERSITY OF VIRGINIA
UNIVERSITY OF WISCONSIN - MADISON

Request	18 Oct, 90	Unspecified
Approval	1 Jun, 92	
In Progress	26 Oct, 96	
Data Analysis	17 Jan, 00	

833 K-SHORT DECAYS #833 — Gordon B. Thomson

BEAM: Meson Area - Center

Letter of Intent to Measure the Branching Ratio for the K-short Decay

UNIV. OF CALIFORNIA, LOS ANGELES
UNIVERSITY OF CHICAGO
ELMHURST COLLEGE
FERMILAB
UNIVERSITY OF ILLINOIS, CHAMPAIGN
RUTGERS UNIVERSITY

Request	19 Oct, 90	Unspecified
Inactive	30 Aug, 95	

834 DIRECT PHOTON #834 — Paul F. Slattery

BEAM: Meson Area - West

Direct Photon Production #834

DELHI UNIVERSITY (INDIA)
FERMILAB
MICHIGAN STATE UNIVERSITY
UNIVERSITY OF MINNESOTA
NORTHEASTERN UNIVERSITY
PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY OF PITTSBURGH
RAJASTHAN UNIVERSITY (INDIA)
UNIVERSITY OF ROCHESTER

Request	19 Oct, 90	Unspecified
Inactive	23 Dec, 92	

835 CHARMONIUM STATES #835 — Rosanna Cester and Stephen H. Pordes

BEAM: Accumulator Ring

Study of Charmonium States formed in Antiproton-proton Annihilations

MOU Executed.

UNIV. OF CALIFORNIA, IRVINE
FERMILAB
UNIVERSITY OF FERRARA (ITALY)
INFN, GENOVA (ITALY)
UNIVERSITY OF MINNESOTA
NORTHWESTERN UNIVERSITY
UNIVERSITY OF TORINO (ITALY)

Request	16 Oct, 90	Unspecified
Approval	7 Dec, 92	Unspecified
In Progress	1 Oct, 96	
Data Analysis	8 Nov, 00	

836 SUPERCONDUCTING DETECTOR TEST #836 — Robert G. Wagner

BEAM: Unspecified Beam

Proposal for a Beam Test of a Superconducting Thin Film Strip Particle Detector

ARGONNE NATIONAL LABORATORY

Request	3 Oct, 90	24 Hours in three 8 hour shifts
Withdrawn	8 Jan, 92	

837 EMPACT/TEXAS TEST #837 — Michael D. Marx

BEAM: Unspecified Beam

EMPACT/TEXAS Beam Test(s)

SUNY AT STONY BROOK

Request	12 Oct, 90	Unspecified
Inactive	23 Dec, 92	

838 POLARIZED BEAM #838 — Akihiko Yokosawa
BEAM: Meson Area - Polarized Proton Beam
Continuation of E-704 and Simultaneous Measurement of Chi-2 Production

ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
FERMILAB
UNIVERSITY OF IOWA
KYOTO SANGYO UNIVERSITY (JAPAN)
KYOTO UNIVERSITY (JAPAN)
KYOTO UNIV. OF EDUCATION (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
LOS ALAMOS NATIONAL LABORATORY
INFN, MESSINA (ITALY)
NEW MEXICO STATE UNIVERSITY
NORTHWESTERN UNIVERSITY
UN. OF OCCUP. & ENV. HEALTH(JAPAN)
OKAYAMA UNIVERSITY (JAPAN)
OLD DOMINION UNIVERSITY
OSAKA CITY UNIVERSITY (JAPAN)
OSAKA UNIV. OF COMMERCE (JAPAN)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)
UNIVERSITY OF UDINE (ITALY)

Request	1 Oct, 90	Unspecified
Rejected	19 Feb, 91	

839 FIBER TRACKING TEST #839 — Seymour Margulies
BEAM: Neutrino Area - Muon Beam
Scintillating Fiber Tracker - Beam Test

UNIV. OF CALIFORNIA, LOS ANGELES
FERMILAB
UNIV. OF ILLINOIS, CHICAGO CIRCLE
NOTRE DAME UNIVERSITY
OSAKA CITY UNIVERSITY (JAPAN)
PENNSYLVANIA STATE UNIVERSITY
PURDUE UNIVERSITY
RICE UNIVERSITY
UNIVERSITY OF TEXAS AT DALLAS
UNIVERSITY OF TSUKUBA (JAPAN)

Request	25 Sep, 90	Unspecified
Approval	15 Apr, 91	Unspecified
Completed	8 Jan, 92	Unspecified

840 SPAGHETTI CALORIMETRY TEST #840 — Adam Para
BEAM: Meson Area - Polarized Proton Beam
Spaghetti calorimetry in '91 test beam cycle

FERMILAB

Request	11 Oct, 90	592 Hours	1. Systematic studies of the laminated prototype (160 hrs.) 2. Studies of the RGB prototype (56 hrs.) 3. Dichromatic calorimeter (80 hrs.) 4. Liquid scintillator prototype (56 hrs.) 5. Two-segment fiber prototype (240 hrs.)
Approval	8 Aug, 91	Unspecified	
Completed	8 Jan, 92	Unspecified	

841 CALORIMETER BEAM TEST #T841 — Lawrence E. Price
BEAM: Meson Area - Test Beam
Proposal for Beam Test of Scintillator Calorimeter Prototypes at Fermilab during FY 1991

ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
FERMILAB
IOWA STATE UNIVERSITY
LAWRENCE BERKELEY LABORATORY
NORTHEASTERN UNIVERSITY
PURDUE UNIVERSITY
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY
UNIVERSITY OF SOUTH CAROLINA
VIRGINIA TECH
WESTINGHOUSE ELECTRIC CORPORATION
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY

Request	8 Oct, 90	Unspecified
Approval	28 Mar, 91	Unspecified
Completed	8 Jan, 92	Unspecified

842 RADIATION EXPOSURE #842 — David G. Underwood
BEAM: Proton Area - Broad Band
Proposed Radiation Measurement in the Wideband Neutral Dump Area

ARGONNE NATIONAL LABORATORY

Request	6 Nov, 90	Unspecified
Approval	15 Aug, 91	Unspecified
Completed	8 Jan, 92	Unspecified

843 EMULSION EXPOSURE 600 GeV #843 — C. O. Kim
BEAM: Neutrino Area - Muon Beam
Interactions of 600 Gev Muons with Emulsion Nuclei

CHONNAM NATIONAL UNIVERSITY(KOREA)
KOREA UNIVERSITY, SEOUL (KOREA)

Request	24 Oct, 90	Unspecified
Approval	1 Jul, 91	Unspecified
Completed	13 Jul, 91	Unspecified

844 TRD/SHOWER COUNTER TEST #844 — Simon P. Swordy
BEAM: Meson Area - Polarized Proton Beam
Transition Radiation Detector/EM Shower Counter Calibration

UNIVERSITY OF CHICAGO

Request	28 Nov, 90	40 Hours
Approval	11 Oct, 91	Unspecified
Completed	26 Dec, 91	Unspecified

845 TEVATRON BEAUTY #845 — Peter E. Schlein
BEAM: Unspecified Beam
A Dedicated Beauty Experiment for the Tevatron Collider

UNIV. OF CALIFORNIA, LOS ANGELES
CERN (SWITZERLAND)
COLLEGE DE FRANCE (FRANCE)
INP, KRAKOW (POLAND)
MAX-PLANCK INSTITUTE (GERMANY)
NANJING UNIVERSITY (PRC)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
YALE UNIVERSITY

Request	7 Jan, 91	Unspecified
Rejected	10 Jul, 91	

846 FRACTIONAL CHARGE IMPURITIES #846 — Unil Perera
BEAM: Meson Area - West
Search for Fractional Charge Impurities

UNIVERSITY OF PITTSBURGH

Request	1 Feb, 91	Unspecified
Inactive	23 Dec, 92	

847 CALORIMETER TEST #847 — Lawrence R. Sulak — BOSTON UNIVERSITY
BEAM: Unspecified Beam
Beam Test for scintillating fiber / lead alloy calorimeter prototype

Request	13 Feb, 91	Unspecified
Completed	8 Jan, 92	

848 GAS CALORIMETRY FOR SDC #848 — Nikos D. Giokaris — ABILITY ENGINEERING TECHNOLOGY; FERMILAB; JINR, DUBNA (RUSSIA); UNIVERSITY OF ROCHESTER; ROCKEFELLER UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON; YEREVAN PHYSICS INST. (ARMENIA)
BEAM: Neutrino Area - Test Beam
High Pressure Sampling Gas Calorimetry for the SDC Calorimeter

Request	29 Mar, 91	Unspecified
Approval	29 Oct, 91	Unspecified
Completed	23 Dec, 91	Unspecified

849 BARIUM FLUORIDE CALORIMETER #849 — Hans G. E. Kobrak — BROOKHAVEN NATIONAL LABORATORY; CALIFORNIA INSTITUTE OF TECHNOLOGY; UNIV. OF CALIFORNIA, SAN DIEGO; CARNEGIE-MELLON UNIVERSITY; OAK RIDGE NATIONAL LABORATORY; PRINCETON UNIVERSITY; TATA INSTITUTE (INDIA)
BEAM: Neutrino Area - Test Beam
Request for Test Beam Time for Barium Fluoride Calorimeter Development

Request	11 Apr, 91	Unspecified	Two (2) "beam on" periods of about 1 month each, separated by a data analysis period of about 1 month.
Approval	18 Sep, 91	Unspecified	
Completed	8 Jan, 92	Unspecified	

850 DIAMOND RADIATION DETECTOR TEST #850 — Melissa Franklin — UNIV. OF CALIFORNIA, SANTA BARBARA; HARVARD UNIVERSITY; KEK (JAPAN); LAWRENCE LIVERMORE LABORATORY; OHIO STATE UNIVERSITY; PRINCETON UNIVERSITY; UNIVERSITY OF ROCHESTER; RUTGERS UNIVERSITY; SSC LABORATORY; STANFORD UNIVERSITY
BEAM: Meson Area - Test Beam
Fermilab Test Beam Time of Diamond Radiation Detectors

Request	1 May, 91	Unspecified
Approval	8 Jan, 92	Unspecified
Withdrawn	8 Jan, 92	Unspecified

851 FIBER IRRADIATION STUDIES #851 — Seymour Margulies and Jadwiga Warchol — UNIV. OF CALIFORNIA, LOS ANGELES; FERMILAB; UNIV. OF ILLINOIS, CHICAGO CIRCLE; NOTRE DAME UNIVERSITY; OAK RIDGE NATIONAL LABORATORY; OSAKA CITY UNIVERSITY (JAPAN); *PENNSYLVANIA STATE UNIVERSITY*; PURDUE UNIVERSITY; RICE UNIVERSITY; UNIVERSITY OF TEXAS AT DALLAS; UNIVERSITY OF TSUKUBA (JAPAN)
BEAM: Collision Area (C-0)
Fiber Irradiation Studies in the C0 Region

Request	1 May, 91	Unspecified
Approval	14 Aug, 91	Unspecified
Completed	8 Jan, 92	Unspecified

852 PIXEL DETECTOR TEST #T852 — Eric Arens — FERMILAB; LAWRENCE BERKELEY LABORATORY
BEAM: Neutrino Area - Muon Beam
Pixel Detector Test at NM

Request	8 May, 91	Unspecified
Approval	9 Sep, 91	Unspecified
Completed	23 Dec, 91	Unspecified

853 TEVATRON CRYSTAL EXTRACTION #853 — C. Thornton Murphy — ARGONNE NATIONAL LABORATORY; UNIV. OF CALIFORNIA, LOS ANGELES; FAIRFIELD UNIVERSITY; FERMILAB; *JINR, DUBNA (RUSSIA)*; UNIVERSITY OF NEW MEXICO; SUNY AT ALBANY; PNPI, ST. PETERSBURG (RUSSIA); IHEP, PROTVINO (SERPUKHOV)(RUSSIA); SOUTWESTERN MEDICAL CENTER; UNIVERSITY OF TEXAS AT AUSTIN; VANDERBILT UNIVERSITY; UNIVERSITY OF VIRGINIA
BEAM: Collision Area (C-0)
A Test of Low Intensity Extraction from the Tevatron Using Channeling in a Bent Crystal

Request	22 May, 91	100 Hours	of dedicated Tevatron time, during which only protons need to be circulating.
	10 May, 93	72 Hours	
Approval	10 May, 93	72 Hours	
Data Analysis	20 Feb, 96		
Completed	1 Mar, 01		

854 MUON FLUXES IN THE DEBUNCHER #854 — Alan D. Bross — COLUMBIA UNIVERSITY; FERMILAB
BEAM: Debuncher Ring
Proposal to Measure the Flux of Ciculating Muons in the Debuncher.

Request	11 Jul, 91	Unspecified
Approval	8 Jan, 92	Unspecified
Completed	8 Jan, 92	Unspecified

855 dE/dx MUONS #855 — George R. Kalbfleisch — UNIVERSITY OF OKLAHOMA; SSC LABORATORY
BEAM: Neutrino Area - Muon Beam
Test Beam Request to Directly Measure dE/dx of High Energy Muons from 150 to 650 GeV/c in Muon Laboratory

Request	3 Aug, 91	Unspecified
Approval	18 Nov, 91	Unspecified
Completed	8 Jan, 92	Unspecified

856 INTEGRATED PIXEL DETECTOR TEST#856 — Sherwood I. Parker
BEAM: Neutrino Area - Muon Beam
An Integrated Pixel Detector - Test Beam Request
UNIVERSITY OF HAWAII AT MANOA
LAWRENCE BERKELEY LABORATORY
STANFORD UNIVERSITY

Request	4 Oct, 91	Unspecified
Approval	11 Oct, 91	Unspecified
Completed	8 Jan, 92	Unspecified

857 SPIN-TENSOR #857 — L. I. Sarycheva
BEAM: Unspecified Beam
Proposal to measure all components of the depolarization tensor.
MOSCOW STATE UNIVERSITY (RUSSIA)

Request	10 Dec, 91	Unspecified
Inactive	23 Dec, 92	

858 ELASTIC SCATTERING SPIN EFFECTS #858 — Alan D. Krisch
BEAM: Unspecified Beam
Spin Effects in High Proton-Proton Elastic Scattering
FERMILAB
INDIANA UNIVERSITY
JINR, DUBNA (RUSSIA)
KEK (JAPAN)
UNIVERSITY OF MICHIGAN - ANN ARBOR
MOSCOW STATE UNIVERSITY (RUSSIA)
UNIVERSITY OF NORTH CAROLINA
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)

Request	6 Jan, 92	Unspecified
Rejected	30 Jul, 92	

859 CP VIOLATION IN HYPERON DECAY #859 — Shao Yuan Hsueh
BEAM: Unspecified Beam
CP Violations in Hyperon Decay
FERMILAB

Request	2 Jan, 92	Unspecified
Withdrawn	13 Jan, 94	

860 SEARCH FOR NEUTRINO OSCILLATIONS#860 — Wonyong Lee
BEAM: Debuncher Ring
A Search for Neutrino Oscillations using the Fermilab Debuncher.
BROOKHAVEN NATIONAL LABORATORY
COLUMBIA UNIVERSITY
FERMILAB
KANGNUNG NATIONAL UNIV. (KOREA)
KOREA UNIVERSITY, SEOUL (KOREA)
SEOUL NATIONAL UNIVERSITY (KOREA)

Request	14 Jan, 92	Unspecified
Withdrawn	17 Jan, 96	

861 ANTIPROTON DECAY #T861 — Steve Geer
BEAM: Accumulator Ring
Test of Backgrounds for an Antiproton Decay Search Experiment at the Antiproton Accumulator
UNIV. OF CALIFORNIA, LOS ANGELES
FERMILAB
PENNSYLVANIA STATE UNIVERSITY

Request	10 Feb, 92	24 Hours
Approval	16 Apr, 92	
Completed	29 Oct, 92	

862 ANTI-HYDROGEN DETECTION #862 — David C. Christian
BEAM: Accumulator Ring
Detection of Relativistic Anti-Hydrogen Atoms produced by Pair Production with Positron Capture
UNIV. OF CALIFORNIA, IRVINE
FERMILAB

Request	27 Aug, 92	Unspecified
Approval	4 Mar, 93	
In Progress	10 Nov, 96	
Data Analysis	18 Sep, 97	
Completed	1 Mar, 99	

863 NUCLEON SPIN #863 — Aldo Penzo
BEAM: Meson Area - Polarized Proton Beam
Nucleon Spin Structure Studies with Polarized Proton and Antiproton Beams
ARGONNE NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
CNRS, MARSEILLE (FRANCE)
UNIVERSITY OF IOWA
KYOTO SANGYO UNIVERSITY (JAPAN)
KYOTO UNIVERSITY (JAPAN)
KYOTO UNIV. OF EDUCATION (JAPAN)
LAPP, D'ANNECY-LE-VIEUX (FRANCE)
INFN, MESSINA (ITALY)
NEW MEXICO STATE UNIVERSITY
UN. OF OCCUP. & ENV. HEALTH(JAPAN)
OKAYAMA UNIVERSITY (JAPAN)
OSAKA CITY UNIVERSITY (JAPAN)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIVERSITY DI TRIESTE (ITALY)

Request	31 Aug, 92	7 Months
Rejected	7 Dec, 92	

864 MAXIMUM ACCEPTANCE DETECTOR #T864 — James D. Bjorken and Cyrus C. Taylor
BEAM: Collision Area (C-0)
Maximum Acceptance Detector for the Fermilab Collider (MAX)
CASE WESTERN RESERVE UNIVERSITY
DUKE UNIVERSITY
FERMILAB
LOS ALAMOS NATIONAL LABORATORY
UNIVERSITY OF MICHIGAN - ANN ARBOR
SLAC
VIRGINIA TECH

Request	1 Sep, 92	Unspecified
Approval	24 May, 93	Unspecified
Completed	20 Dec, 95	

865 CHARM AND BEAUTY DECAYS #865 — Daniel M. Kaplan
BEAM: Meson Area - East
High-Sensitivity Study of Charm and Beauty Decays.
ABILENE CHRISTIAN UNIVERSITY
UNIV. OF CALIFORNIA, LOS ANGELES
CEN-SACLAY (FRANCE)
CERN (SWITZERLAND)
CINVESTAV-IPN (MEXICO)
FERMILAB
ILLINOIS INSTITUTE OF TECHNOLOGY
IOWA STATE UNIVERSITY
UNIVERSITE DE LAUSANNE
NORTHERN ILLINOIS UNIVERSITY
UNIVERSITY OF SOUTH CAROLINA
UNIVERSITY OF TEXAS AT DALLAS

Request	1 Sep, 92	Unspecified
Withdrawn	4 Feb, 94	

866	ANTI(U-QUARK)/ANTI(D-QUARK) DIST#866	Michael J. Leitch	ABILENE CHRISTIAN UNIVERSITY ARGONNE NATIONAL LABORATORY FERMILAB GEORGIA STATE UNIVERSITY ILLINOIS INSTITUTE OF TECHNOLOGY LOS ALAMOS NATIONAL LABORATORY LOUISIANA STATE UNIVERSITY NEW MEXICO STATE UNIVERSITY OAK RIDGE NATIONAL LABORATORY TEXAS A&M UNIVERSITY VALPARAISO UNIVERSITY

BEAM: Meson Area - East
Measurement of x distribution of the ratio of anti(u-quark) to anti(d-quark) in the proton

Request	2 Sep, 92	Unspecified
Approval	7 Dec, 92	Unspecified
In Progress	14 Sep, 96	
Data Analysis	6 Aug, 97	

867	HIDDEN CHARM AND BEAUTY #867	Bradley B. Cox	UNIVERSITY OF SOUTH ALABAMA UNIV. OF CALIFORNIA, BERKELEY UNIV. OF CALIFORNIA, LOS ANGELES FERMILAB UNIVERSITY OF HOUSTON JINR, DUBNA (RUSSIA) UNIVERSITY OF LECCE (ITALY) MCGILL UNIVERSITY (CANADA) ACADEMY OF SCI. OF BSSR (BYELARUS) NANJING UNIVERSITY (PRC) NORTHWESTERN UNIVERSITY UNIVERSITY OF PAVIA (ITALY) UNIVERSITY OF PENNSYLVANIA PRAIRIE VIEW A&M UNIVERSITY SHANDONG UNIVERSITY (PRC) IHEP, TBILISI STATE UNIV (GEORGIA) VANIER COLLEGE (CANADA) UNIVERSITY OF VIRGINIA UNIVERSITY OF WISCONSIN - MADISON YEREVAN PHYSICS INST. (ARMENIA)

BEAM: Proton Area - West
A Proposal to Continue the Study of Hidden Charm and Beauty States by Triggering on High Transverse Momentum Single Muons and High Mass Dimuons in 800 GeV/c pN Interactions

Request	3 Sep, 92	Unspecified
Rejected	28 Feb, 94	

868	ANTIPROTON DECAY #868	Steve Geer	UNIV. OF CALIFORNIA, LOS ANGELES FERMILAB UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF NEBRASKA PENNSYLVANIA STATE UNIVERSITY

BEAM: Accumulator Ring
Proposal to Search for Antiproton Decay at the Fermilab Antiproton Accumulator

Request	24 Sep, 92	Unspecified
Approval	4 Mar, 93	
Data Analysis	24 Jul, 95	
Completed	1 Mar, 01	

869	GEM DETECTOR AT THE SSC #869	Barry C. Barish and William J. Willis	FERMILAB SSC LABORATORY

BEAM: Meson Area - West
Testing of Components for the GEM Detector at the Superconducting Super Collider Laboratory: A Proposal to the Fermi National Accelerator Laboratory

Request	11 Nov, 92	Unspecified
Withdrawn	4 Jan, 94	

870	PROTOTYPE DETECTORS FOR THE SDC #870	George H. Trilling	FERMILAB LAWRENCE BERKELEY LABORATORY SSC LABORATORY

BEAM: Meson Area - Polarized Proton Beam
PROTOTYPE DETECTORS FOR THE SDC #870

Request	1 Jan, 93	Unspecified
Withdrawn	4 Jan, 94	

871	CP VIOLATION #871	Kam-Biu Luk and Edmond Craig Dukes	IHEP, ACADEMIA SINICA (TAIWAN) UNIVERSITY OF SOUTH ALABAMA UNIV. OF CALIFORNIA, BERKELEY FERMILAB UNIVERSITY OF GUANAJUATO (MEXICO) ILLINOIS INSTITUTE OF TECHNOLOGY UNIVERSITE DE LAUSANNE LAWRENCE BERKELEY LABORATORY UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF VIRGINIA

BEAM: Meson Area - Center
A Search for CP Violation in the Decays of Cascade minus / Anti-Cascade plus and Neutral Lambda / Neutral Anti-Lambda Hyperons

Request	21 Mar, 93	Unspecified
Approval	29 Jun, 94	Unspecified Stage I approval.
In Progress	20 Feb, 97	
Data Analysis	21 Jan, 00	

872	TAU NEUTRINO #872	Vittorio Paolone and Byron G. Lundberg	AICHI UNIV. OF EDUCATION (JAPAN) UNIVERSITY OF ATHENS (GREECE) UNIV. OF CALIFORNIA, DAVIS CHANGWON NATIONAL UNIV. (KOREA) CHONNAM NATIONAL UNIVERSITY(KOREA) FERMILAB COLLEGE DE FRANCE (FRANCE) GYEONGSANG NATIONAL UNIV. (KOREA) KANSAS STATE UNIVERSITY KOBE UNIVERSITY (JAPAN) KON-KUK UNIVERSITY (KOREA) KOREAN NTNL.UN.OF EDUCATION(KOREA) UNIVERSITY OF MINNESOTA NAGOYA UNIVERSITY (JAPAN) OSAKA SCIENCE EDUC. INST. (JAPAN) UNIVERSITY OF SOUTH CAROLINA TOHO UNIVERSITY (JAPAN) TUFTS UNIVERSITY UTSUNOMIYA UNIVERSITY (JAPAN)

BEAM: Proton Area - West
BEAM DUMP #872

Request	26 Mar, 93	Unspecified
Approval	29 Jun, 94	Unspecified Stage I approval granted. 10 to the 18th protons-on-target minimum.
In Progress	20 Feb, 97	
Data Analysis	3 Sep, 97	

873 BOOSTER NEUTRINOS #873 — Fred J. Federspiel and H. White — LOS ALAMOS NATIONAL LABORATORY
BEAM: Booster Accelerator
Letter of Intent to Perform a Neutrino Experiment using the Fermilab 8 GEV Booster

Request	21 Oct, 94	Unspecified
Unconsidered	21 Oct, 94	
Inactive	3 Feb, 98	

874 CHARGED PION LIFETIME #874 — Steve Geer — DUKE UNIVERSITY, FERMILAB, UNIVERSITY OF NEBRASKA, ROCKEFELLER UNIVERSITY
BEAM: Meson Area - West
Precision Measurement of the Lifetime of Charged Pions

Request	9 Nov, 94	Unspecified
Withdrawn	16 Dec, 96	

875 NEUTRINO OSCILLATIONS #875 — Stanley G. Wojcicki — ARGONNE NATIONAL LABORATORY, UNIVERSITY OF ATHENS (GREECE), IHEP, BEIJING (PRC), BROOKHAVEN NATIONAL LABORATORY, CALIFORNIA INSTITUTE OF TECHNOLOGY, UNIVERSITY OF CAMBRIDGE (ENGLAND), UNIVERSITY OF CHICAGO, ELMHURST COLLEGE, FERMILAB, HARVARD UNIVERSITY, INDIANA UNIVERSITY, JAMES MADISON UNIVERSITY, LAWRENCE LIVERMORE LABORATORY, LEBEDEV PHYSICAL INST. (RUSSIA), UNIVERSITY COLLEGE LONDON (ENGLAND), MACALESTER COLLEGE, UNIVERSITY OF MINNESOTA, UNIVERSITY OF MINNESOTA, DULUTH, ITEP, MOSCOW (RUSSIA), NORTHWESTERN UNIVERSITY, UNIVERSITY OF OXFORD (ENGLAND), UNIVERSITY OF PITTSBURGH, IHEP, PROTVINO (SERPUKHOV)(RUSSIA), RUTHERFORD-APPLETON LABS.(ENGLAND), UNIVERSITY OF SOUTH CAROLINA, STANFORD UNIVERSITY, SUSSEX UNIVERSITY (ENGLAND), TEXAS A&M UNIVERSITY, UNIVERSITY OF TEXAS AT AUSTIN, TUFTS UNIVERSITY, WESTERN WASHINGTON UNIVERSITY, UNIVERSITY OF WISCONSIN - MADISON
BEAM: Main Injector Area
A Long-baseline Neutrino Oscillation Experiment at Fermilab

Request	9 Feb, 95	Unspecified
Approval	2 May, 95	
Unscheduled	2 May, 95	

876 CDF HARD DIFFRACTION STUDIES #876 — Mike G. Albrow — IHEP, ACADEMIA SINICA (TAIWAN), ARGONNE NATIONAL LABORATORY, UNIVERSITY OF BOLOGNA (ITALY), BRANDEIS UNIVERSITY, UNIV. OF CALIFORNIA, LOS ANGELES, CIPP (CANADA), UNIVERSITY OF CHICAGO, DUKE UNIVERSITY, FERMILAB, INFN, FRASCATI (ITALY), HARVARD UNIVERSITY, HIROSHIMA UNIVERSITY (JAPAN), UNIVERSITY OF ILLINOIS, CHAMPAIGN, JOHNS HOPKINS UNIVERSITY, KEK (JAPAN), LAWRENCE BERKELEY LABORATORY, MASSACHUSETTS INST. OF TECHNOLOGY, UNIVERSITY OF MICHIGAN - ANN ARBOR, MICHIGAN STATE UNIVERSITY, UNIVERSITY OF NEW MEXICO, OSAKA CITY UNIVERSITY (JAPAN), UNIVERSITY OF PADOVA (ITALY), UNIVERSITY OF PENNSYLVANIA, INFN, PISA (ITALY), UNIVERSITY OF PITTSBURGH, PURDUE UNIVERSITY, UNIVERSITY OF ROCHESTER, ROCKEFELLER UNIVERSITY, RUTGERS UNIVERSITY, TEXAS A&M UNIVERSITY, TEXAS TECH UNIVERSITY, UNIVERSITY OF TSUKUBA (JAPAN), TUFTS UNIVERSITY, WASEDA UNIVERSITY (JAPAN), UNIVERSITY OF WISCONSIN - MADISON, YALE UNIVERSITY
BEAM: Collision Area (B-0)
Proposal for Hard Diffraction Studies in CDF

Request	17 Jan, 95	Unspecified
Approval	3 Aug,.95	
Data Analysis	20 Feb, 96	

877 AXION SEARCH #877 — Siu Au Lee — COLORADO STATE UNIVERSITY, FERMILAB, JOINT INST. FOR LAB. ASTROPHYSICS, SSC LABORATORY
BEAM: Beam Not Applicable
Measurement of the Magnetically-Induced QED Birefringence of the Vacuum and an Improved Laboratory Search for Axions

Request	28 Mar, 95	Unspecified
Unconsidered	28 Mar, 95	
Rejected	14 Mar, 00	

878 SPIN STRUCTURE FUNCTION PHYSICS #878 — Joel M. Moss — LOS ALAMOS NATIONAL LABORATORY
BEAM: Main Injector Area
Spin Structure Function Physics at Fermilab.

Request	7 Nov, 95	Unspecified
Unconsidered	7 Nov, 95	
Inactive	3 Feb, 98	

879	B PHYSICS TEST BEAM PROGRAM #879	Joel N. Butler and Walter Selove	CARNEGIE-MELLON UNIVERSITY FERMILAB UNIVERSITY OF PENNSYLVANIA SYRACUSE UNIVERSITY
	BEAM: Meson Area - Test Beam		
	A Test Beam Program for Future B Physics Experiments at Fermilab		
	Request 16 Mar, 95 Unspecified		
	Unconsidered 16 Mar, 95		
	Inactive 3 Feb, 98		
880	B PHYSICS TEST BEAM PROGRAM #880	Sheldon L. Stone	CARNEGIE-MELLON UNIVERSITY FERMILAB UNIVERSITY OF MINNESOTA SYRACUSE UNIVERSITY WAYNE STATE UNIVERSITY
	BEAM: Meson Area - Test Beam		
	Proposal for Test Beam Running of the CLEO III RICH Detector		
	Request 16 Mar, 95 Unspecified		
	Unconsidered 16 Mar, 95		
	Approval 28 Feb, 96		
	Data Analysis 19 May, 97		
	Completed 1 Mar, 01		
881	AUGER PROJECT R&D #881	Paul M. Mantsch	FERMILAB
	BEAM: Beam Not Applicable		
	A Request for Fermilab R&D Support for the Pierre Auger Project.		
	Request 6 Nov, 95 Unspecified		
	Approval 8 Oct, 96		
	Unscheduled 8 Oct, 96		
882	SEARCH FOR LOW MASS MONOPOLES #882	George R. Kalbfleisch	UNIVERSITY OF OKLAHOMA
	BEAM: Beam Not Applicable		
	A Search for Low Mass Monopoles		
	Request 15 Aug, 95 Unspecified		
	Approval 23 Jul, 96		
	Unscheduled 23 Jul, 96		
	In Progress 23 Sep, 96		
	Data Analysis 1 Mar, 01		
883	COSMIC RAY CALORIMETER CALIB. #883	James H. Adams	LEBEDEV PHYSICAL INST. (RUSSIA) MOSCOW STATE UNIVERSITY (RUSSIA) NAVAL RESEARCH LABORATORY
	BEAM: Meson Area - West		
	Calibration of Cosmic Ray "Thin Ionization Calorimeter"		
	Request 26 Oct, 95		
	Unconsidered 26 Oct, 95		
	Approval 16 Jul, 97		
	Data Analysis 6 Aug, 97		
	Completed 1 Mar, 01		
884	COSMIC RAY DETECTOR TEST #884	Sun Kee Kim	LOUISIANA STATE UNIVERSITY UNIVERSITY OF MARYLAND MAX-PLANCK INSTITUTE (GERMANY) MOSCOW STATE UNIVERSITY (RUSSIA) NAVAL RESEARCH LABORATORY SEOUL NATIONAL UNIVERSITY (KOREA) SOUTHERN UNIVERSITY, BATON ROUGE
	BEAM: Meson Area - West		
	A proposal for a Beam Test of the Advanced Thin Ionization Calorimeter Detector		
	Request 1 Feb, 96		
	Unconsidered 1 Feb, 96		
	Inactive 15 Mar, 99		
885	SLOAN DIGITAL SKY SURVEY #885	Stephen M. Kent	FERMILAB
	BEAM: Beam Not Applicable		
	SLOAN DIGITAL SKY SURVEY		
	Approval 9 Feb, 96		
	Unscheduled 9 Feb, 96		
	In Progress 1 Jun, 98		
886	PICOSECOND X-RAY SOURCE #886	Adrian C. Melissinos	FERMILAB UNIVERSITY OF ROCHESTER
	BEAM: A0 Facility		
	Compton Scattering X-Ray Experiments at the Fermilab Electron Source Facility		
	Request 14 May, 96		
	Approval 8 Oct, 96		
	Unscheduled 8 Oct, 96		
	In Progress 1 Mar, 99		
887	PET ACCELERATOR #887	Ralph Pasquinelli	FERMILAB
	BEAM: Beam Not Applicable		
	A RFQ Linear Accelerator for PET Isotope Production		
	Request 21 Jun, 95		
	Approval 21 Jun, 95		
	Unscheduled 21 Jun, 95		
	Completed 31 Aug, 98		
888	P-BAR+NUCLEI STUDIES #888	Vic. E. Viola	INDIANA UNIVERSITY
	BEAM: Main Injector Area		
	P-Bar + A Studies of the Nuclear Equation-of-State		
	Request 15 Jul, 96		
	Unconsidered 15 Jul, 96		
889	NEUTRINOS AT THE BOOSTER #889	Alexander Abashian	VIRGINIA TECH
	BEAM: Booster Accelerator		
	Letter of Intent to Study Neutrino Oscillations Using the Fermilab Booster Beam		
	Request 6 Aug, 96		
	Unconsidered 6 Aug, 96		
	Inactive 15 Mar, 99		
890	PLASMA WAKE-FIELD ACCELERATOR #890	James R. Rosenzweig	UNIV. OF CALIFORNIA, LOS ANGELES FERMILAB
	BEAM: A0 Facility		
	Advanced Accelerator Test at the Fermilab Electron Source Facility		
	Request 25 Sep, 96		
	Approval 8 Oct, 96		
	Unscheduled 8 Oct, 96		
	Setup in a Year 1 Mar, 99		
	In Progress 1 Jan, 00		

891	DARK MATTER SEARCH #891 BEAM: Beam Not Applicable The Cryogenic Dark Matter Search (CDMS)	Roger L. Dixon	FERMILAB

Request	4 Mar, 96
Approval	4 Mar, 96
Unscheduled	4 Mar, 96
In Progress	1 Jan, 98

892	CMS AT FERMILAB #892 BEAM: Beam Not Applicable The U.S. Compact Muon Solenoid (CMS) Collaboration at Fermilab	Daniel R. Green	FERMILAB

Request	8 Oct, 96
Approval	8 Oct, 96
Unscheduled	8 Oct, 96

893	LHC ACCELERATOR #893 BEAM: Beam Not Applicable Design and Construction of Interaction Regions at the CERN Large Hadron Collider (LHC)	James B. Strait	FERMILAB

Request	8 Oct, 96
Approval	8 Oct, 96
Unscheduled	8 Oct, 96

894	CPT TEST #894 BEAM: Main Injector Area An Experiment Studying Kl - Ks Interference to Test CPT Conservation at the Planck Scale	Gordon B. Thomson	RUTGERS UNIVERSITY TRIUMF (CANADA)

Request	7 Oct, 96
Unconsidered	7 Oct, 96
Rejected	6 Jul, 99

895	PIXEL DETECTOR TEST #895 BEAM: Meson Area - Test Pixel Detector Test	Simon Kwan	FERMILAB

Request	17 Mar, 97
Withdrawn	28 Jan, 98

896	RADIO COHERENCE TEST #896 BEAM: Main Injector Area Test of the Principle of Radio Coherence	David Besson	UNIVERSITY OF KANSAS

Request	4 Nov, 96
Unconsidered	4 Nov, 96

897	BTeV R&D #897 BEAM: Collision Area (C-0) BTeV: A Heavy Quark Program at C0	Joel N. Butler and Sheldon Stone	CARNEGIE-MELLON UNIVERSITY UNIVERSITY OF COLORADO AT BOULDER FERMILAB UNIVERSITY OF FLORIDA ILLINOIS INSTITUTE OF TECHNOLOGY UNIVERSITY OF ILLINOIS, CHAMPAIGN INDIANA UNIVERSITY UNIVERSITY OF IOWA INFN, MILANO (ITALY) UNIVERSITY OF MINNESOTA NANJING UNIVERSITY (PRC) NEW MEXICO STATE UNIVERSITY OHIO STATE UNIVERSITY INFN, PAVIA (ITALY) UNIVERSITY OF PENNSYLVANIA IHEP, PROTVINO (SERPUKHOV)(RUSSIA) UNIV.OF PUERTO RICO - MAYAGUEZ UNIV.OF SCI & TECH., HEFEI (PRC) SHANDONG UNIVERSITY (PRC) SYRACUSE UNIVERSITY UNIVERSITY OF TENNESSEE, KNOXVILLE TUFTS UNIVERSITY VANDERBILT UNIVERSITY UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY YORK UNIVERSITY

Request	18 May, 97
Unconsidered	18 May, 97
Approval	13 Jan, 98
Unscheduled	13 Jan, 98
In Progress	15 Jun, 99
Data Analysis	21 Jul, 00

898	MINIBOONE #898 BEAM: Booster Accelerator An Experiment to Measure nu-mu->nu-e Oscillations and nu-mu Disappearance at the Fermilab Booster	Janet M. Conrad and William Charles Louis	BUCKNELL UNIVERSITY UNIV.OF CALIFORNIA, RIVERSIDE UNIVERSITY OF CINCINNATI COLUMBIA UNIVERSITY EMBRY RIDDLE AERONAUTICAL UNIV. FERMILAB LOS ALAMOS NATIONAL LABORATORY LOUISIANA STATE UNIVERSITY UNIVERSITY OF MICHIGAN - ANN ARBOR PRINCETON UNIVERSITY

Request	16 May, 97
Unconsidered	16 May, 97
Approval	4 Jun, 98
Unscheduled	4 Jun, 98
Setup in a Year	1 Mar, 01

899	PARTICLE PRODUCTION #899 BEAM: Collision Area (C-0) Particle Production at Zero Degrees from the	Michael Longo	CASE WESTERN RESERVE UNIVERSITY LOUISIANA STATE UNIVERSITY UNIVERSITY OF MICHIGAN FERMILAB UNIVERSITY OF TENNESSEE

Request	31 May, 97
Rejected	23 Oct, 97

900	D-0 FORWARD PROTON DETECTOR #900 BEAM: Collision Area (D-0) A Forward Proton Detector at D-0	Hendrik J. Weerts and William J. Womersley	INST.OF PHYS.ACADEMY OF SCI(CZECH) UNIV. OF AMSTERDAM (NETHERLANDS) UNIVERSIDAD DE LOS ANDES(COLOMBIA) UNIVERSITY OF ARIZONA IHEP, BEIJING (PRC) BOSTON UNIVERSITY BROOKHAVEN NATIONAL LABORATORY BROWN UNIVERSITY UNIVERSIDAD DE BUENOS AIRES CALIFORNIA STATE UNIVERSITY UNIV. OF CALIFORNIA, IRVINE UNIV. OF CALIFORNIA, RIVERSIDE CBPF (BRAZIL) CEA-SACLAY (FRANCE) CPPM, MARSEILLE (FRANCE) CHARLES UNIVERSITY (CZECH) CINVESTAV-IPN (MEXICO) COLUMBIA UNIVERSITY CZECH TECHNICAL UNIVERSITY (CZECH) DELHI UNIVERSITY (INDIA) FERMILAB FLORIDA STATE UNIVERSITY UNIV. OF ILLINOIS, CHICAGO CIRCLE IMPERIAL COLLEGE (ENGLAND) INDIANA UNIVERSITY ISN (GRENOBLE, FRANCE) IOWA STATE UNIVERSITY JINR, DUBNA (RUSSIA) KANSAS STATE UNIVERSITY UNIVERSITY OF KANSAS INP, KRAKOW (POLAND) LAL, ORSAY (FRANCE) LANCASTER UNIVERSITY LANGSTON UNIVERSITY LAWRENCE BERKELEY LABORATORY LOUISIANA TECH UNIVERSITY LPNHE, UN. OF P & M CURIE (FRANCE) LUDWIG MAXIMILIANS UNIV.(GERMANY) UNIVERSITY OF MAINZ (GERMANY) UNIVERSITY OF MANCHESTER (ENGLAND) UNIVERSITY OF MARYLAND UNIVERSITY OF MICHIGAN - ANN ARBOR MICHIGAN STATE UNIVERSITY MOSCOW STATE UNIVERSITY (RUSSIA) ITEP, MOSCOW (RUSSIA) UNIVERSITY OF NEBRASKA SUNY AT STONY BROOK NIJMEGEN UNIVERSITY (NETHERLANDS) NIKHEF-H, AMSTERDAM (NETHERLANDS) NORTHEASTERN UNIVERSITY NORTHERN ILLINOIS UNIVERSITY NORTHWESTERN UNIVERSITY NOTRE DAME UNIVERSITY UNIVERSITY OF OKLAHOMA PANJAB UNIVERSITY (INDIA) PAULISTA, UNIV. ESTADUAL, (BRAZIL) PNPI, ST. PETERSBURG (RUSSIA) IHEP, PROTVINO (SERPUKHOV)(RUSSIA) RICE UNIVERSITY UNIV. FEDERAL DO RIO DE JANEIRO UNIVERSITY OF ROCHESTER UN.SAN FRANCISCO DE QUITO(ECUADOR) TATA INSTITUTE (INDIA) UNIVERSITY OF TEXAS AT ARLINGTON UNIVERSITY OF VIRGINIA UNIVERSITY OF WASHINGTON

Request	17 Sep, 97
Unconsidered	17 Sep, 97
Approval	29 May, 98
Unscheduled	29 May, 98
Setup in a Year	1 Mar, 01

901	RECYCLER ELECTRON COOLING #901 BEAM: Beam Not Applicable Recycler Medium Energy Electron Cooling Experiment	Sergei Nagaitsev	CEBAF - THOMAS JEFFERSON LAB. FERMILAB INDIANA UNIVERSITY JINR, DUBNA (RUSSIA)

Request	14 Nov, 97
Approval	14 Nov, 97
Unscheduled	14 Nov, 97
Setup in a Year	1 Jan, 00
In Progress	1 Mar, 01

902	EXOTIC ATOMS #902 BEAM: Main Injector Area Particle Mass Measurement and Strong Interaction Studies with Exotic Atoms Using X-Ray Crystal Spectrometer	Yuri M. Ivanov	PNPI, ST. PETERSBURG (RUSSIA)

Request	24 Sep, 97
Unconsidered	24 Sep, 97

903	TEST FOR ANTIHYDROGEN SPECTROSCOPY#903 BEAM: Booster Accelerator A Test Experiment at the Fermilab Booster to Study the Feasibility of Fast Antihydrogen Spectroscopy	Mark A. Mandelkern	UNIV. OF CALIFORNIA, IRVINE FERMILAB UNIVERSITY OF ROCHESTER

Request	20 Mar, 98
Unconsidered	20 Mar, 98

904	MUON COLLIDING R&D #904 BEAM: Unspecified Beam Ionization Cooling Research and Development Program for a High Luminosity Muon Collider Collider	Steve Geer	CEBAF - THOMAS JEFFERSON LAB. ARGONNE NATIONAL LABORATORY BROOKHAVEN NATIONAL LABORATORY BUDKER INS.NUCLEAR PHYSICS(RUSSIA) UNIV. OF CALIFORNIA, BERKELEY UNIV. OF CALIFORNIA, LOS ANGELES FAIRFIELD UNIVERSITY FERMILAB INDIANA UNIVERSITY UNIVERSITY OF IOWA JOSEPH HENRY LABORATORIES LAWRENCE BERKELEY NTL. LABORATORY UNIVERSITY OF MISSISSIPPI ROCKEFELLER UNIVERSITY

Request	15 Apr, 98
Unconsidered	15 Apr, 98

905	CKM R&D #905 BEAM: Main Injector Area A Proposal for a Precision Measurement of the Decay K+ to pi+-nu-nubar and Other Rare K+ Processes at Fermilab Using the Main Injector	Peter S. Cooper	BROOKHAVEN NATIONAL LABORATORY FERMILAB UNIVERSITY OF MICHIGAN - ANN ARBOR IHEP, PROTVINO (SERPUKHOV)(RUSSIA) UN.AUTO.DE SAN LUIS POTOSI(MEXICO) UNIVERSITY OF TEXAS AT AUSTIN UNIVERSITY OF VIRGINIA

Request	15 Apr, 98
Unconsidered	15 Apr, 98
Approval	6 Jul, 99
In Progress	6 Jul, 99

906	ANTI(U-QUARK)/ANTI(D-QUARK) DIST #906 BEAM: Main Injector Area Letter of Intent for Drell-Yan Measurements of Nucleon and Nuclear Structure with The FNAL Main Injector	Donald Geesaman	ABILENE CHRISTIAN UNIVERSITY ARGONNE NATIONAL LABORATORY FERMILAB GEORGIA STATE UNIVERSITY ILLINOIS INSTITUTE OF TECHNOLOGY LOS ALAMOS NATIONAL LABORATORY LOUISIANA STATE UNIVERSITY NEW MEXICO STATE UNIVERSITY OAK RIDGE NATIONAL LABORATORY TEXAS A&M UNIVERSITY VALPARAISO UNIVERSITY

Request	15 Apr, 98
Unconsidered	15 Apr, 98

907	PARTICLE PRODUCTION #907 BEAM: Main Injector Area Proposal to Measure Particle Production in the Meson Area Using Main Injector Primary and Secondary Beams	Rajendran Raja	BROOKHAVEN NATIONAL LABORATORY FERMILAB LAWRENCE LIVERMORE NTL. LABORATORY STANFORD UNIVERSITY

Request	21 Jul, 97
Unconsidered	15 Apr, 98
Deferred	8 Nov, 00

908 D-0 SILICON TRACK TRIGGER #908 Hendrik J. Weerts and William J. Womersley

BEAM: Collision Area (D-0)

A Silicon Track Trigger for the D0 Experiment in Run II

INST.OF PHYS.ACADEMY OF SCI(CZECH)
UNIV. OF AMSTERDAM (NETHERLANDS)
UNIVERSIDAD DE LOS ANDES(COLOMBIA)
UNIVERSITY OF ARIZONA
IHEP, BEIJING (PRC)
BOSTON UNIVERSITY
BROOKHAVEN NATIONAL LABORATORY
BROWN UNIVERSITY
UNIVERSIDAD DE BUENOS AIRES
CALIFORNIA STATE UNIVERSITY
UNIV. OF CALIFORNIA, DAVIS
UNIV. OF CALIFORNIA, IRVINE
UNIV. OF CALIFORNIA, RIVERSIDE
CBPF (BRAZIL)
CEA-SACLAY (FRANCE)
CPPM, MARSEILLE (FRANCE)
CHARLES UNIVERSITY (CZECH)
CINVESTAV-IPN (MEXICO)
COLUMBIA UNIVERSITY
CZECH TECHNICAL UNIVERSITY (CZECH)
DELHI UNIVERSITY (INDIA)
FERMILAB
FLORIDA STATE UNIVERSITY
UNIV. OF ILLINOIS, CHICAGO CIRCLE
IMPERIAL COLLEGE (ENGLAND)
INDIANA UNIVERSITY
ISN (GRENOBLE, FRANCE)
IOWA STATE UNIVERSITY
JINR, DUBNA (RUSSIA)
KANSAS STATE UNIVERSITY
UNIVERSITY OF KANSAS
INP, KRAKOW (POLAND)
LAL, ORSAY (FRANCE)
LANCASTER UNIVERSITY
LANGSTON UNIVERSITY
LAWRENCE BERKELEY LABORATORY
LOUISIANA TECH UNIVERSITY
LPNHE, UN. OF P & M CURIE (FRANCE)
UNIVERSITY OF MANCHESTER (ENGLAND)
UNIVERSITY OF MARYLAND
UNIVERSITY OF MICHIGAN - ANN ARBOR
MICHIGAN STATE UNIVERSITY
MOSCOW STATE UNIVERSITY (RUSSIA)
ITEP, MOSCOW (RUSSIA)
UNIVERSITY OF NEBRASKA
SUNY AT STONY BROOK
NIJMEGEN UNIVERSITY (NETHERLANDS)
NIKHEF-H, AMSTERDAM (NETHERLANDS)
NORTHEASTERN UNIVERSITY
NORTHERN ILLINOIS UNIVERSITY
NORTHWESTERN UNIVERSITY
NOTRE DAME UNIVERSITY
UNIVERSITY OF OKLAHOMA
PANJAB UNIVERSITY (INDIA)
PAULISTA, UNIV. ESTADUAL, (BRAZIL)
PNPI, ST. PETERSBURG (RUSSIA)
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RICE UNIVERSITY
UNIV. FEDERAL DO RIO DE JANEIRO
UNIVERSITY OF ROCHESTER
UN.SAN FRANCISCO DE QUITO(ECUADOR)
TATA INSTITUTE (INDIA)
TEXAS A&M UNIVERSITY
UNIVERSITY OF TEXAS AT ARLINGTON
UNIVERSITY OF WASHINGTON

Request	21 Sep, 98	
Unconsidered	21 Sep, 98	
Approval	29 Jan, 99	Stage I
	15 Nov, 99	Stage II
Setup in a Year	1 Jan, 00	

909	CDF INNER SILICON AND TOF #909 BEAM: Collision Area (B-0) Proposal for Enhancement of the CDF II Detector: An Inner Silicon Layer and a Time of Flight Detector	Franco Bedeschi and Alfred Goshaw	IHEP, ACADEMIA SINICA (TAIWAN) ARGONNE NATIONAL LABORATORY UNIVERSITY OF BOLOGNA (ITALY) BRANDEIS UNIVERSITY UNIV. OF CALIFORNIA, DAVIS UNIV. OF CALIFORNIA, LOS ANGELES CIPP (CANADA) UNIVERSITY OF CANTABRIA (SPAIN) UNIVERSITY OF CHICAGO DUKE UNIVERSITY FERMILAB UNIVERSITY OF FLORIDA INFN, FRASCATI (ITALY) UNIVERSITY OF GENEVA (SWITZERLAND) GLASGOW UNIVERSITY (SCOTLAND) HARVARD UNIVERSITY HIROSHIMA UNIVERSITY (JAPAN) UNIVERSITY OF ILLINOIS, CHAMPAIGN INFN, TRIESTE/UNIV.DI UDINE(ITALY) JINR, DUBNA (RUSSIA) JOHNS HOPKINS UNIVERSITY UNIVERSITY OF KARLSRUHNE (GERMANY) KEK (JAPAN) KYUNGPOOK NATIONAL UNIV. (KOREA) LAWRENCE BERKELEY LABORATORY UNIVERSITY OF LIVERPOOL (ENGLAND) UNIVERSITY COLLEGE LONDON(ENGLAND) MASSACHUSETTS INST. OF TECHNOLOGY UNIVERSITY OF MICHIGAN - ANN ARBOR MICHIGAN STATE UNIVERSITY ITEP, MOSCOW (RUSSIA) UNIVERSITY OF NEW MEXICO OHIO STATE UNIVERSITY OSAKA CITY UNIVERSITY (JAPAN) UNIVERSITY OF OXFORD (ENGLAND) UNIVERSITY OF PADOVA (ITALY) UNIVERSITY OF PENNSYLVANIA INFN, PISA (ITALY) UNIVERSITY OF PITTSBURGH PURDUE UNIVERSITY UNIVERSITY OF ROCHESTER ROCKEFELLER UNIVERSITY UNIVERSITY OF ROME (ITALY) RUTGERS UNIVERSITY TEXAS A&M UNIVERSITY TEXAS TECH UNIVERSITY UNIVERSITY OF TSUKUBA (JAPAN) TUFTS UNIVERSITY WASEDA UNIVERSITY (JAPAN) UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY

Request	22 Sep, 98	
Unconsidered	22 Sep, 98	
Approval	29 Jan, 99	Stage I L00 & TOF
	6 Jul, 99	Stage II L00
	15 Nov, 99	Stage II TOF
Unscheduled	29 Jan, 99	
Setup in a Year	1 Jan, 00	

910	SPIN@FERMI #910 BEAM: Main Injector Area SPIN@FERMI Proposal - Analyzing Power A_nin High P-Transverse Squared Proton-Proton Elastic Scattering	Alan D. Krisch	INST.NUCL.RESEARCH,TROITSK(RUSSIA) JINR, DUBNA (RUSSIA) UNIVERSITY OF MICHIGAN - ANN ARBOR IHEP, PROTVINO (SERPUKHOV)(RUSSIA) TRIUMF (CANADA) UNIVERSITY OF VIRGINIA

Request	1 Aug, 98
Unconsidered	1 Aug, 98
Rejedted	6 Jul, 99

911	DIAMOND DETECTOR TEST #911 BEAM: Meson Area - Test Beam Fermilab Test Beam Proposal for Diamond Tracking Detectors	Robert L. Stone	FERMILAB OHIO STATE UNIVERSITY RUTGERS UNIVERSITY UNIVERSITY OF TORONTO (CANADA)

Request	23 Nov, 98
Unconsidered	23 Nov, 98
Approval	29 Jul, 99
Completed	21 Jan, 00

912	HADRON CALORIMETER TEST #912 BEAM: Meson Area - Test Beam Beam Test of High-Performance Hadron Calorimeter for Future Linear Colliders	Tohru Takeshita and Teruki Kamon	UNIV. OF CALIFORNIA, LOS ANGELES KEK (JAPAN) KOBE UNIVERSITY (JAPAN) KONAN UNIVERSITY (JAPAN) SHINSHU UNIVERSITY (JAPAN) TEXAS A&M UNIVERSITY UNIVERSITY OF TSUKUBA (JAPAN)

Request	1 Feb, 99
Unconsidered	1 Feb, 99
Approval	3 Sep, 99
Completed	30 Sep, 99

913	TRD TEST #913 BEAM: Meson Area - Test Beam Proposal for Calibration and Testing of a Transition Radiation Detector for Space Applications	Simon P. Swordy	UNIVERSITY OF CHICAGO

Request	29 Dec, 98
Unconsidered	29 Dec, 98
Approval	19 Nov, 99
Completed	21 Jan, 00

914	ANTIPROTON TRAPPING #914 BEAM: Beam Not Applicable A Magnetic Degrading Spectrometer for Trapping of Low-Energy Antiprotons at Fermilab	Gerald A. Smith	PENNSYLVANIA STATE UNIVERSITY SYNERGISTIC TECHNOLOGIES, INC.

Request	28 Oct, 98
Rejected	6 Jul, 99

915 MINOS EMULSION DETECTOR #915 Stanley G. Wojcicki
BEAM: Main Injector Area
The Hybrid Emulsion Detector for MINOS - R&D Proposal

ARGONNE NATIONAL LABORATORY
UNIVERSITY OF ATHENS (GREECE)
IHEP, BEIJING (PRC)
BROOKHAVEN NATIONAL LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
UNIVERSITY OF CHICAGO
ELMHURST COLLEGE
FERMILAB
HARVARD UNIVERSITY
INDIANA UNIVERSITY
JAMES MADISON UNIVERSITY
JINR, DUBNA (RUSSIA)
LAWRENCE LIVERMORE LABORATORY
LEBEDEV PHYSICAL INST. (RUSSIA)
UNIVERSITY COLLEGE LONDON (ENGLAND)
UNIVERSITY OF MINNESOTA
ITEP, MOSCOW (RUSSIA)
NORTHWESTERN UNIVERSITY
UNIVERSITY OF OXFORD (ENGLAND)
UNIVERSITY OF PITTSBURGH
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)
RUTHERFORD-APPLETON LABS.(ENGLAND)
UNIVERSITY OF SOUTH CAROLINA
STANFORD UNIVERSITY
SUSSEX UNIVERSITY (ENGLAND)
TEXAS A&M UNIVERSITY
UNIVERSITY OF TEXAS AT AUSTIN
TUFTS UNIVERSITY
WESTERN WASHINGTON UNIVERSITY
UNIVERSITY OF WISCONSIN - MADISON

Request	19 Apr, 99
Unconsidered	22 Jul, 99
Rejected	15 Nov, 99

916 CDF MINIPLUGS #916 Franco Bedeschi and Alfred Goshaw
BEAM: Collision Area (B-0)
Further Studies in Hard Diffraction and Very Forward Physics

IHEP, ACADEMIA SINICA (TAIWAN)
ARGONNE NATIONAL LABORATORY
UNIVERSITY OF BOLOGNA (ITALY)
BRANDEIS UNIVERSITY
UNIV. OF CALIFORNIA, DAVIS
UNIV. OF CALIFORNIA, LOS ANGELES
CIPP (CANADA)
UNIVERSITY OF CANTABRIA (SPAIN)
UNIVERSITY OF CHICAGO
DUKE UNIVERSITY
FERMILAB
UNIVERSITY OF FLORIDA
INFN, FRASCATI (ITALY)
UNIVERSITY OF GENEVA (SWITZERLAND)
GLASGOW UNIVERSITY (SCOTLAND)
HARVARD UNIVERSITY
HIROSHIMA UNIVERSITY (JAPAN)
UNIVERSITY OF ILLINOIS, CHAMPAIGN
INFN, TRIESTE/UNIV.DI UDINE(ITALY)
JINR, DUBNA (RUSSIA)
JOHNS HOPKINS UNIVERSITY
UNIVERSITY OF KARLSRUHNE (GERMANY)
KEK (JAPAN)
KYUNGPOOK NATIONAL UNIV. (KOREA)
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF LIVERPOOL (ENGLAND)
UNIVERSITY COLLEGE LONDON(ENGLAND)
MASSACHUSETTS INST. OF TECHNOLOGY
UNIVERSITY OF MICHIGAN - ANN ARBOR
MICHIGAN STATE UNIVERSITY
ITEP, MOSCOW (RUSSIA)
UNIVERSITY OF NEW MEXICO
OHIO STATE UNIVERSITY
OSAKA CITY UNIVERSITY (JAPAN)
UNIVERSITY OF OXFORD (ENGLAND)
UNIVERSITY OF PADOVA (ITALY)
UNIVERSITY OF PENNSYLVANIA
INFN, PISA (ITALY)
UNIVERSITY OF PITTSBURGH
PURDUE UNIVERSITY
UNIVERSITY OF ROCHESTER
ROCKEFELLER UNIVERSITY
UNIVERSITY OF ROME (ITALY)
RUTGERS UNIVERSITY
TEXAS A&M UNIVERSITY
TEXAS TECH UNIVERSITY
UNIVERSITY OF TSUKUBA (JAPAN)
TUFTS UNIVERSITY
WASEDA UNIVERSITY (JAPAN)
UNIVERSITY OF WISCONSIN - MADISON
YALE UNIVERSITY

Request	4 Oct, 99
Deferred	15 Nov, 99
Being Installed	1 Mar, 01

917 HYPERCP PARTICLE MEASUREMENT #917 Richard H. Gustafson
BEAM: Meson Area - Center
Test to Parasitically Measure the Charge of Muon-Like Particles Emerging from the HYPERCP Beam Dump

FERMILAB
UNIVERSITY OF MICHIGAN - ANN ARBOR

Request	30 Nov, 99
Approval	20 Dec, 99
Data Analysis Completed	17 Jan, 00 1 Mar, 01

918	B PHYSICS AT THE TEVATRON #918 BEAM: Collision Area (C-0) Proposal for an Experiment to Measure Mixing, CP Violation and Rare Decays in Charm and Beauty Particle Decays at the Fermilab Collider - BTeV	Joel N. Butler and Sheldon Stone	UNIVERSITY OF COLORADO AT BOULDER FERMILAB UNIV. OF CALIFORNIA, DAVIS UNIVERSITY OF FLORIDA UNIVERSITY OF HOUSTON ILLINOIS INSTITUTE OF TECHNOLOGY UNIVERSITY OF ILLINOIS, CHAMPAIGN INDIANA UNIVERSITY UNIVERSITY OF IOWA INFN, MILANO (ITALY) UNIVERSITY OF MINNESOTA NANJING UNIVERSITY (PRC) NEW MEXICO STATE UNIVERSITY SUNY AT ALBANY OHIO STATE UNIVERSITY INFN, PAVIA (ITALY) UNIVERSITY OF PENNSYLVANIA IHEP, PROTVINO (SERPUKHOV)(RUSSIA) UNIV.OF PUERTO RICO - MAYAGUEZ UNIV.OF SCI & TECH., HEFEI (PRC) SHANDONG UNIVERSITY (PRC) SOUTHERN METHODIST UNIVERSITY SYRACUSE UNIVERSITY UNIVERSITY OF TENNESSEE, KNOXVILLE TUFTS UNIVERSITY VALPARAISO UNIVERSITY VANDERBILT UNIVERSITY WAYNE STATE UNIVERSITY UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY YORK UNIVERSITY

Request	15 May, 00
Approval	21 Jul, 00
Unscheduled	21 Jul, 00

919	US CMS SILICON TRACKER #919 BEAM: Beam Not Applicable US CMS Silicon Tracker	Daniel R. Green	FERMILAB

Request	7 Jun, 00
Approval	13 Nov, 00
Unscheduled	13 Nov, 00

*** End of Report ***