Fermilab Research Program 1999

Workbook

March, 1999

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Batavia, Illinois

Operated by Universities Research Association, Inc.
Under Contract with the United States Department of Energy

Price $5.00

INTRODUCTION

For the over 20 years of its existence, the Workbook has been graced by the artwork of Angela Gonzales, including the distinctive Workbook covers. Sadly for the remainder of us, Angela retired in 1998. Since it would not be possible for those of us remaining to achieve the same mixture of artistry and feeling for science that Angela did throughout her long Fermilab career, the cover this year has been intentionally kept very simple.

The other people who have been involved in the Workbook over the years have also contributed to this 1999 edition. Many thanks are due to Taiji Yamanouchi for his encouragement and advice, to Jud Parker for keeping up the database which forms the basis for much of the Workbook, and to Jackie Coleman in particular, who puts together all the parts and makes a Workbook out of them.

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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	Withdrawn/Inactive	Proposals that were not considered at the request of the spokesperson or that are no longer being considered for other reasons.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, 913 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	Mar 1999
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
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
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
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
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
"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
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
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
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
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
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

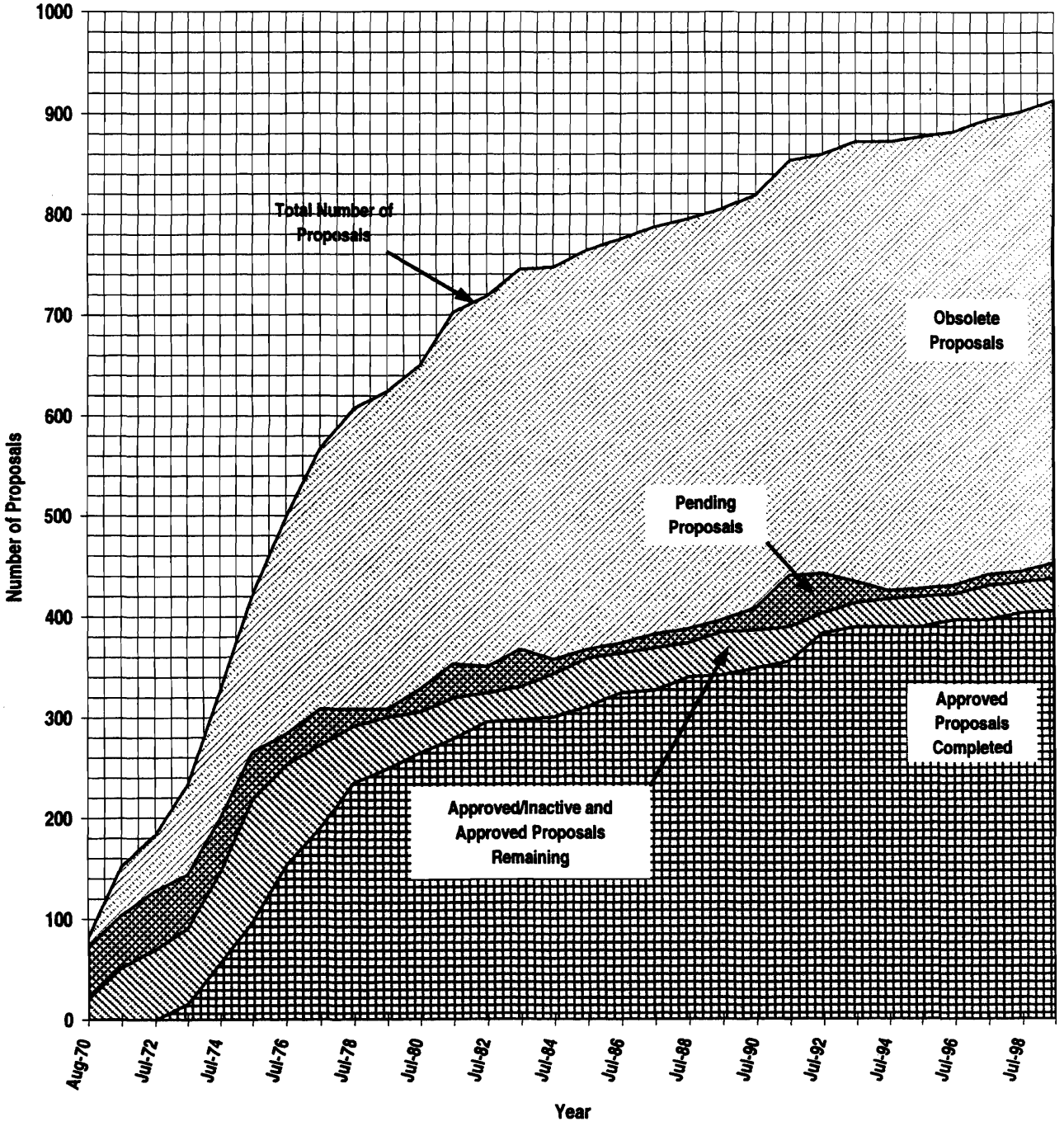

Figure 1. Growth of the Fermilab research program. The total number of approved experiments is obtained by adding the numbers shown as completed and those remaining and approved/inactive. Pending proposals are those which are unconsidered, deferred or "not approved;" obsolete proposals are rejected or 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 1992-93 and 1994-96, and also the 800 GeV Fixed Target runs of 1990, 1991, and 1996-97. A Tevatron fixed target peak intensity with the Main Ring as injector, of 2.86×10^{13} protons per pulse, was achieved in 1997.

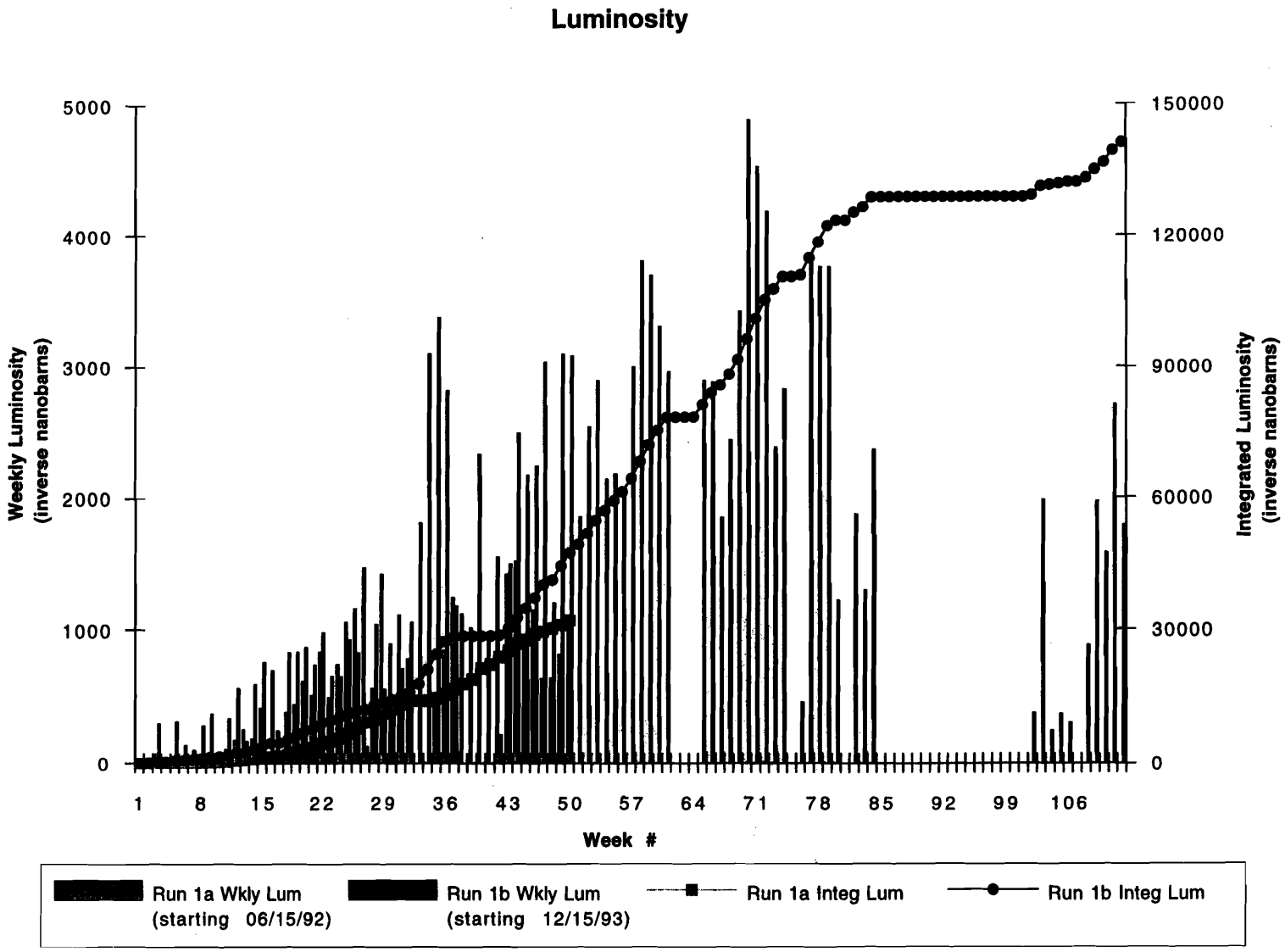

Figure 2. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - luminosity per week and integrated luminosity.

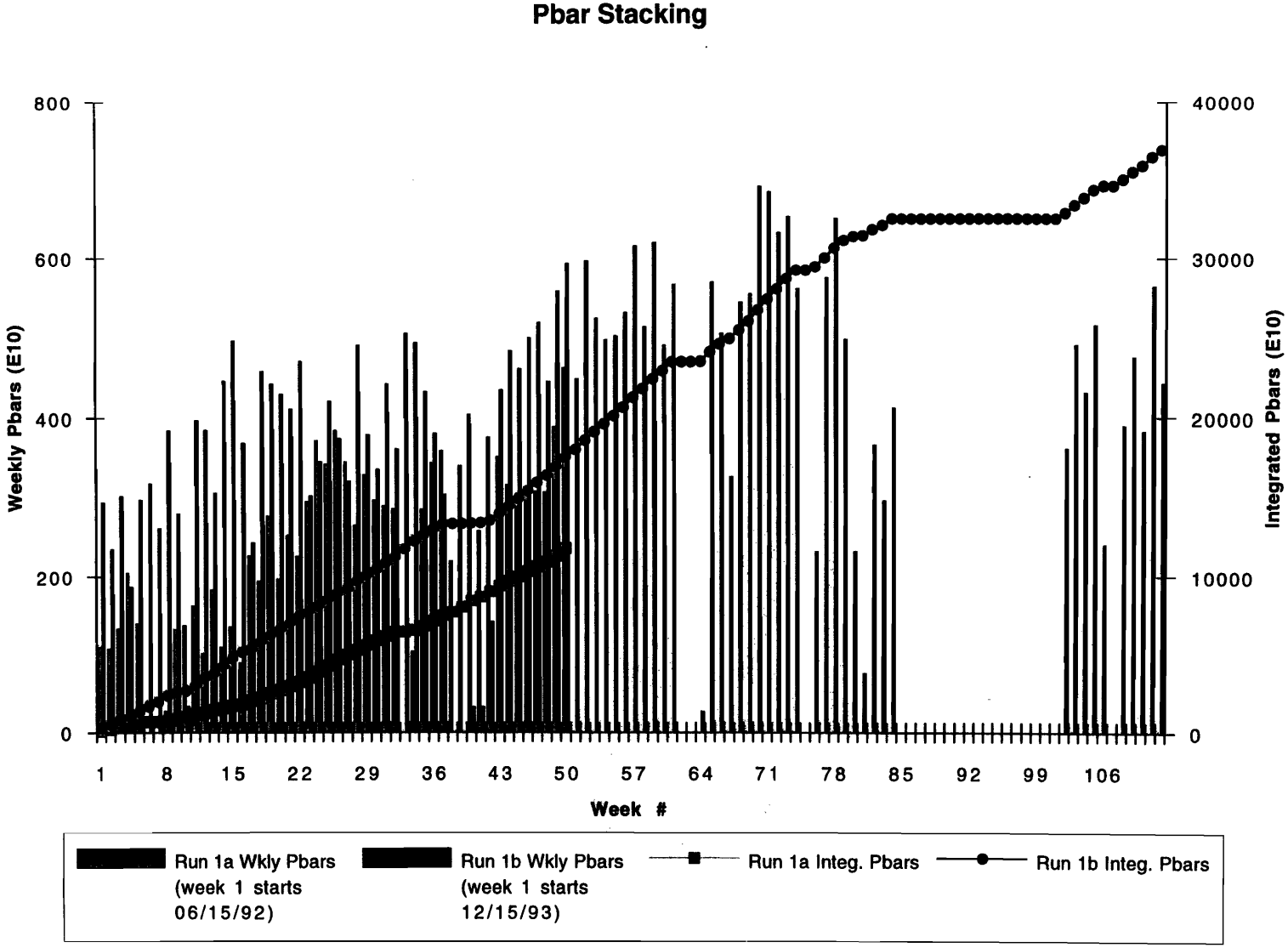

Figure 3. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - antiproton stacking per week and integrated stacking.

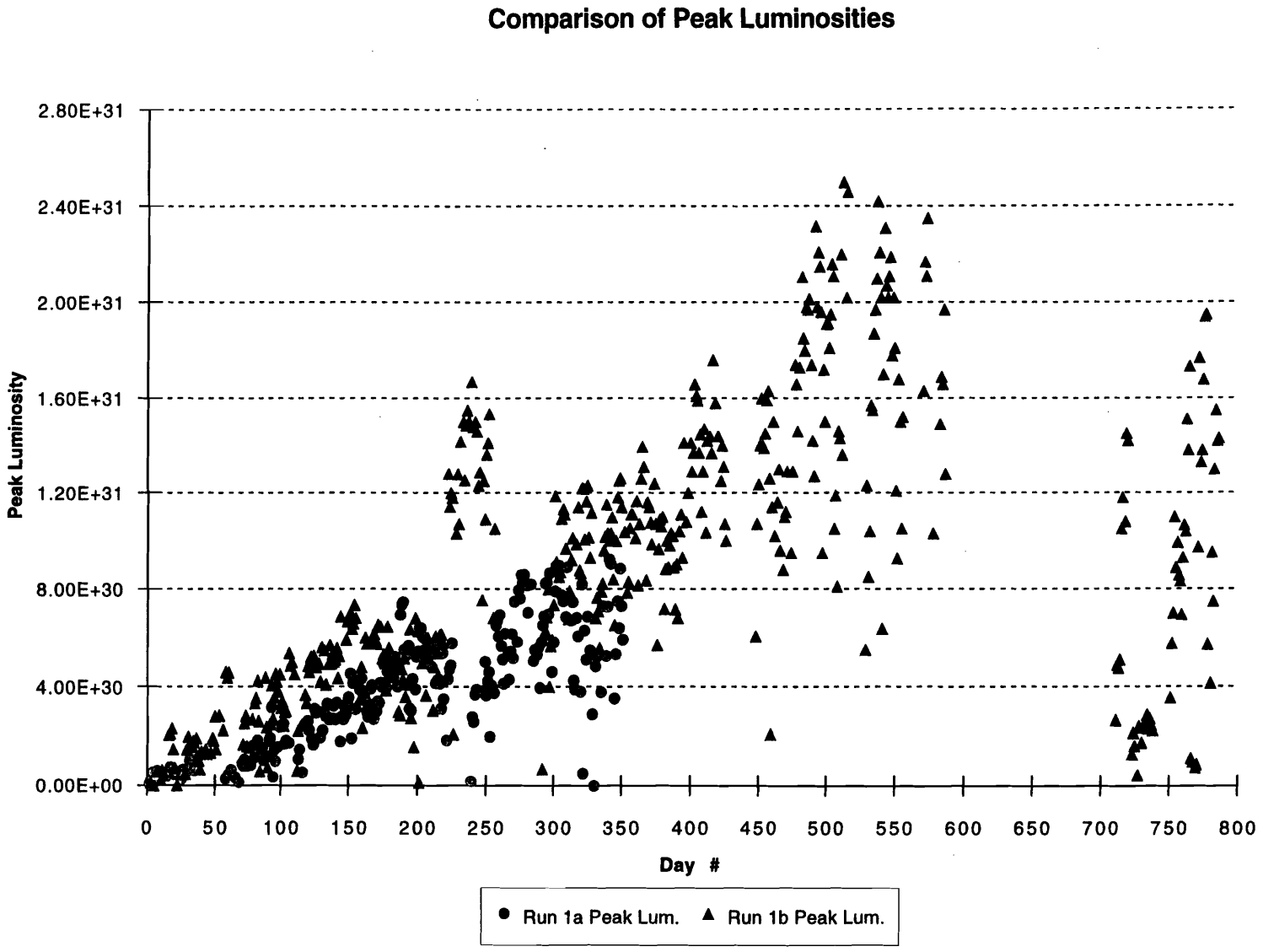

Figure 4. Tevatron Collider operation during the 1992-1993 and 1994-96 running periods - daily peak luminosity.

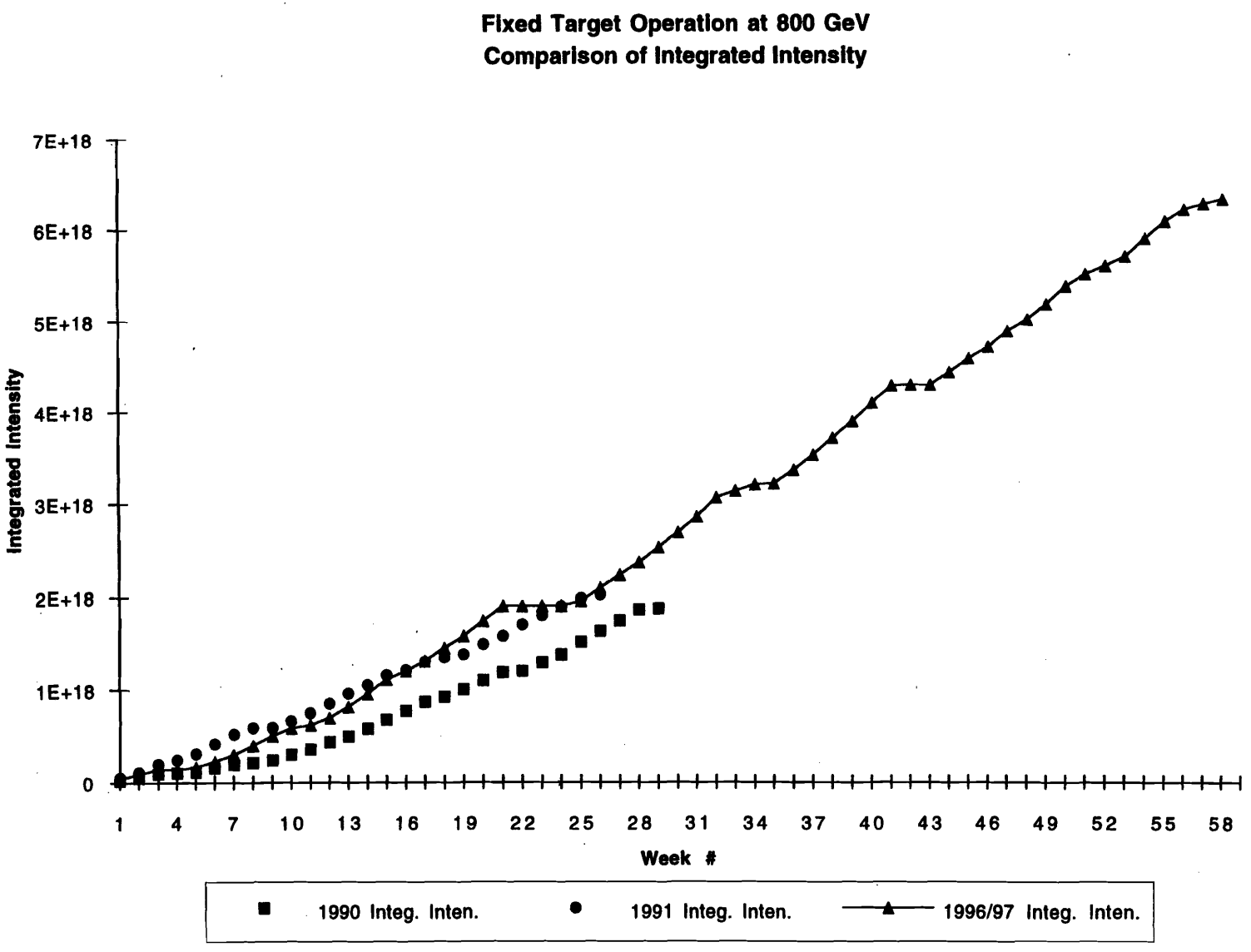

Figure 5. Integrated intensity for the 1990, 1991 and 1996-97 Fixed Target running periods.

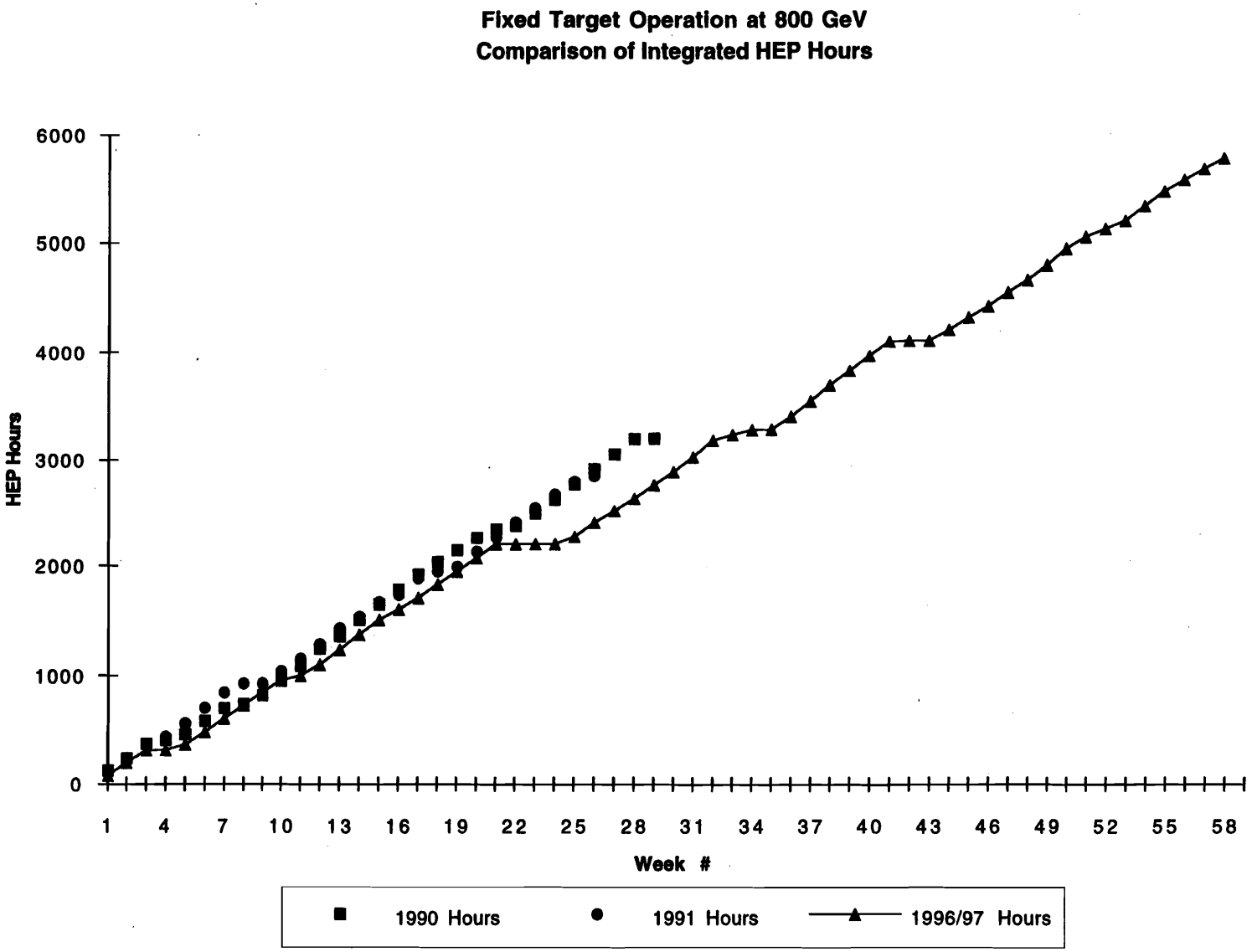

Figure 6. Integrated high energy physics hours for the 1990, 1991 and 1996-97 Fixed Target running periods.

SECTION III. FERMILAB BEAM PROPERTIES AND EXPERIMENT LOCATION

In 1999, there will be the final currently scheduled 800 GeV Fixed Target run, with two major experiments (E-799/832 and E-871) taking data. Properties of the beamlines which will be used are listed in Table 2. The locations of all beamlines are shown in Figure 7, while the locations of the E-799/832 and E-871 experiments are shown in Figure 8. In 1999/2000, the charmonium production experiment E-835 will run in the Accumulator. Figure 9 gives the locations of Collider and Accumulator experiments, while Figure 10 shows the overall accelerator layout including future neutrino experiments E-875 and E-898.

The Main Injector will become operational in 1999; Table 3 shows the number of 120 GeV protons/hours that can be expected from it under various operating scenarios. Figures 11, 12, and 13 show expected fluxes of some neutrino and secondary hadron beams using the Main Injector.

The major reason for the Main Injector has always been to increase the performance of the Tevatron; luminosities should increase to ~1×10^{32} $cm^{-2}sec^{-1}$ in the Collider mode, and in Fixed Target, there should be over 5×10^{13} protons per ~20 sec spill every ~60 seconds.

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

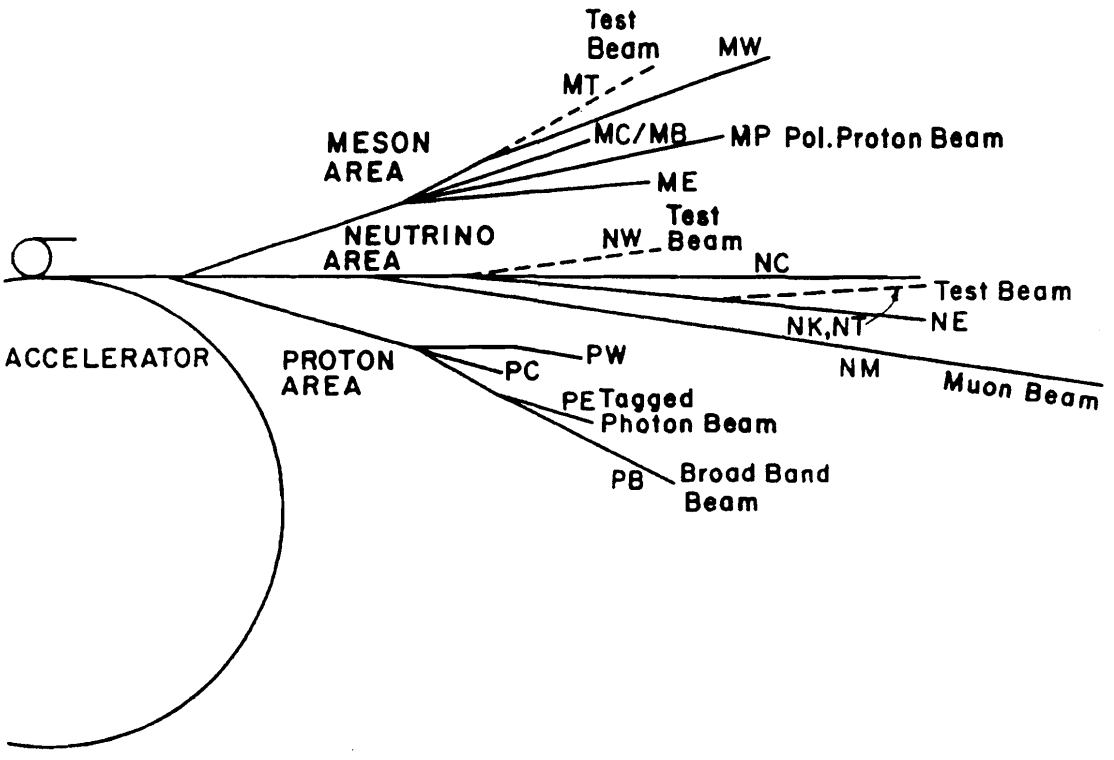

Figure 7. Layout of Fermilab Fixed Target area beams.

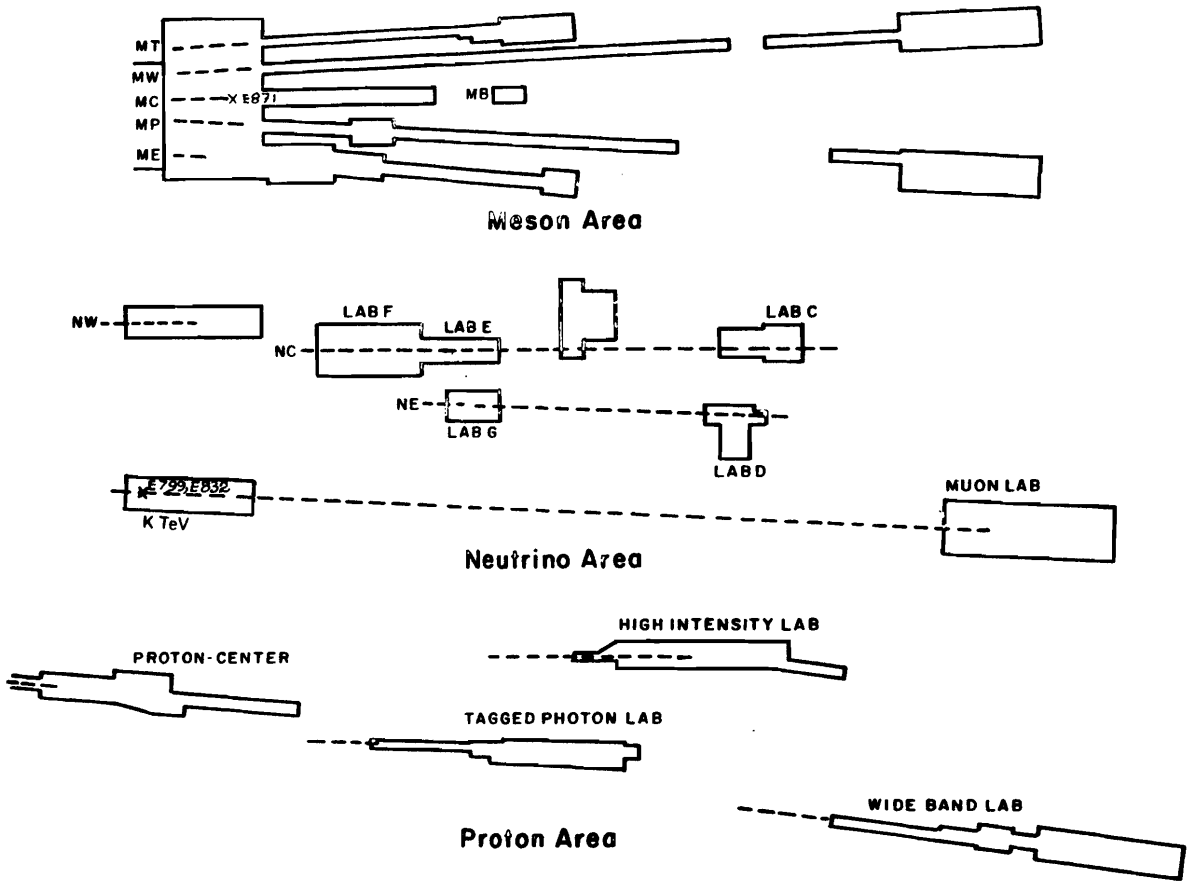

Figure 8. Schematic of the Fixed Target experimental areas with locations of the major experiments which will run in the 1999 800 GeV Fixed Target run. Not shown are future experiments E-875 and E-898, which will use neutrino beams from the Main Injector and the Booster, respectively. The drawings are not to scale.

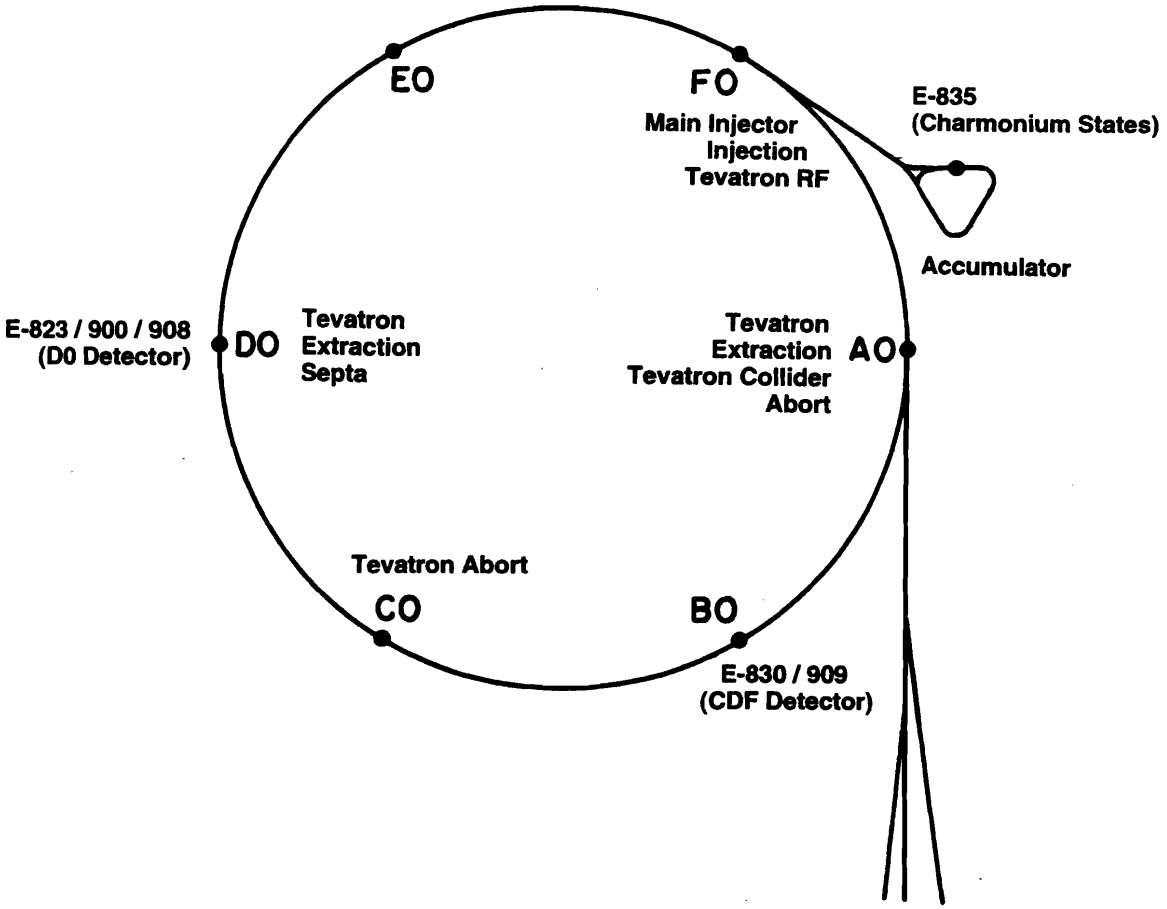

Figure 9. Locations in the Tevatron of the approved $p\bar{p}$ Collider experiments and the charmonium production experiment which uses the Antiproton Accumulator.

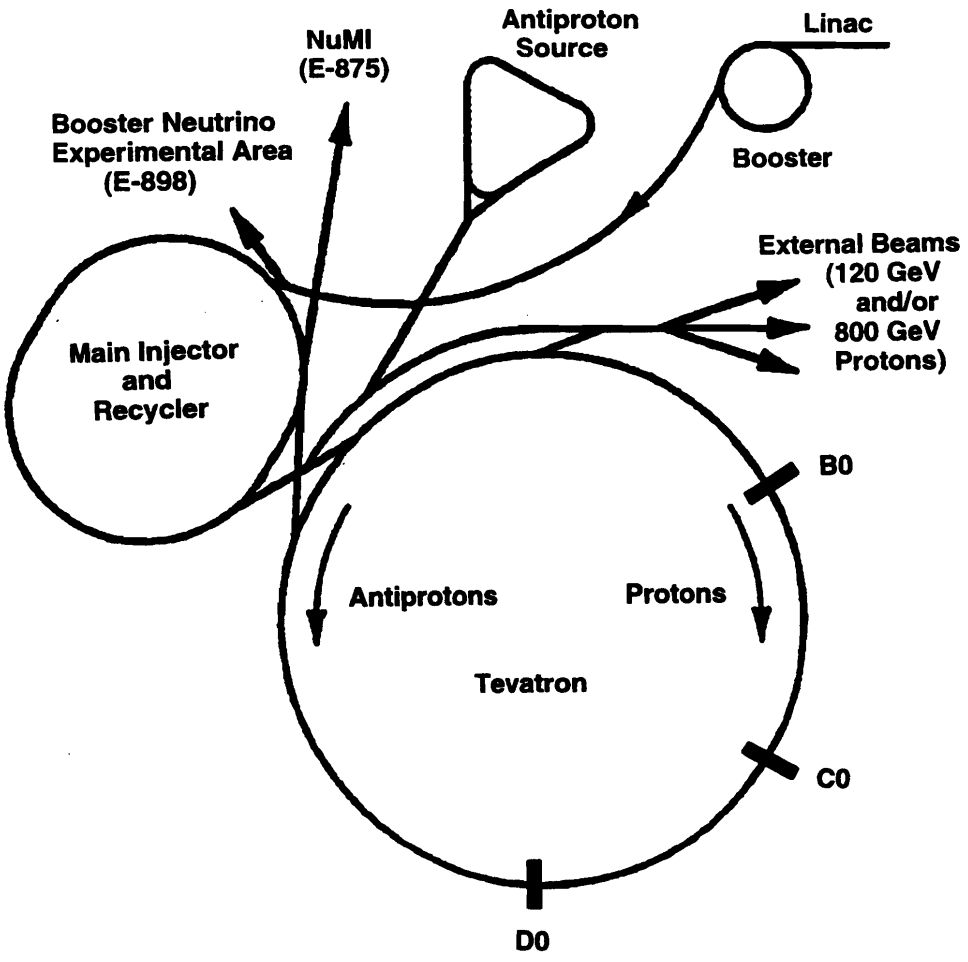

Figure 10. Schematic layout of Fermilab accelerators with present and future experimental areas.

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.]

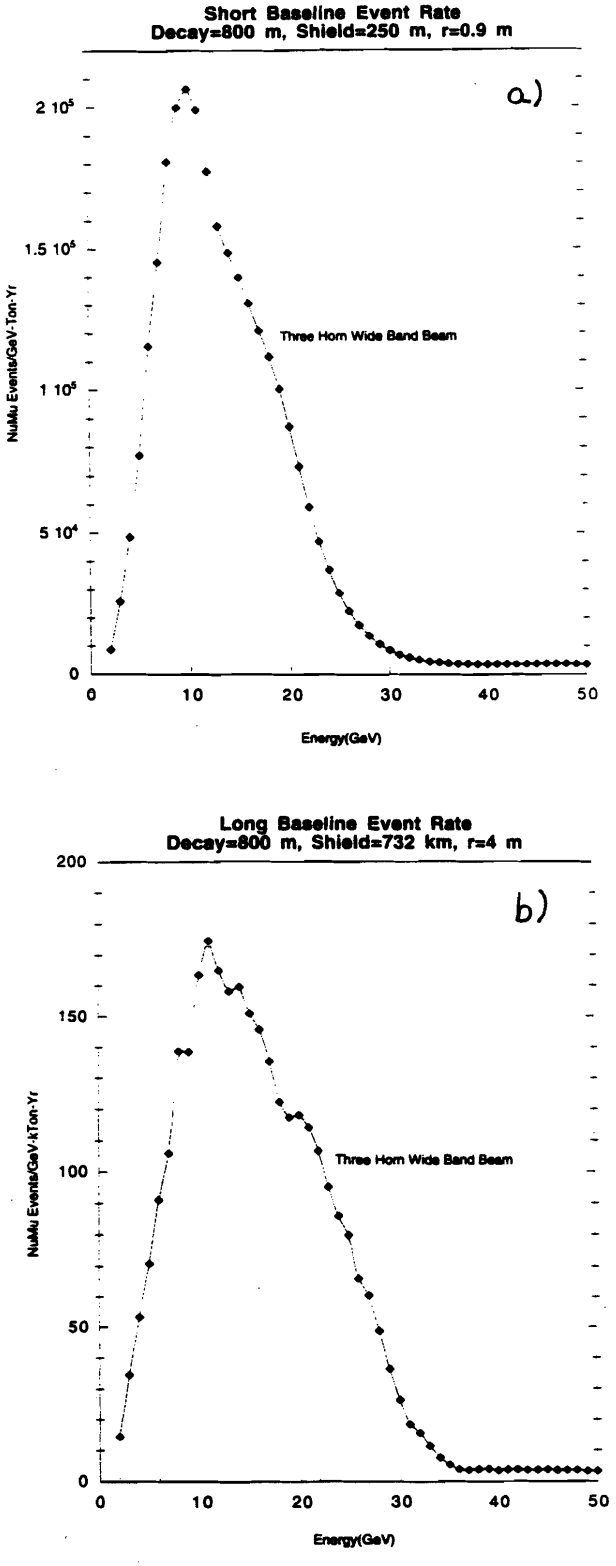

Figure 11. Main Injector, 120 GeV protons: Neutrino event rates for a) short-baseline (per ton), and b) long-baseline (per kton). One year is taken as 3.7×10^{20} incident protons.

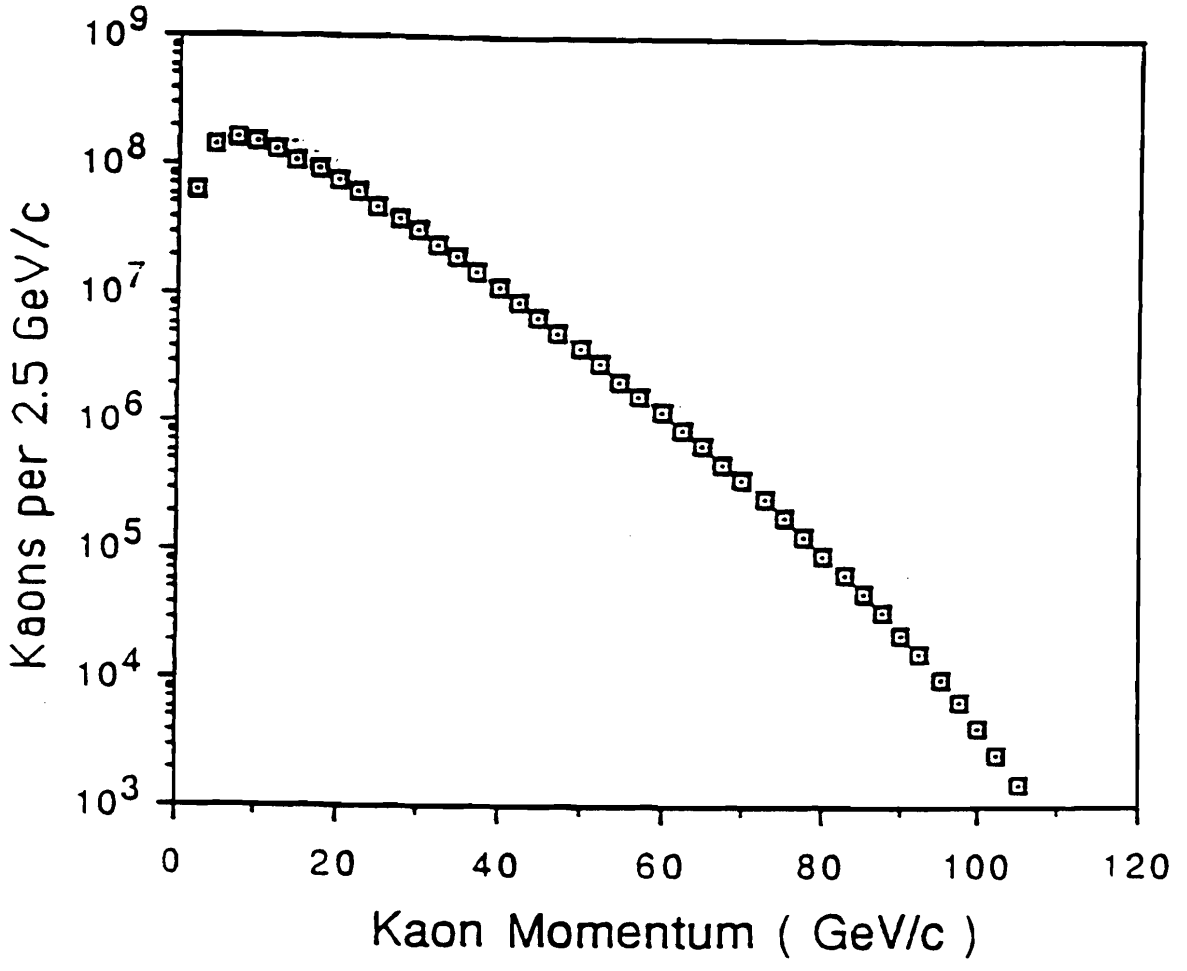

Figure 12. Main Injector: K^0 flux per 2.5 GeV assuming 3×10^{13} 120 GeV protons on a 50 cm target, 12 μstr beam, at 24 mrad targeting angle, including absorbers and filters.

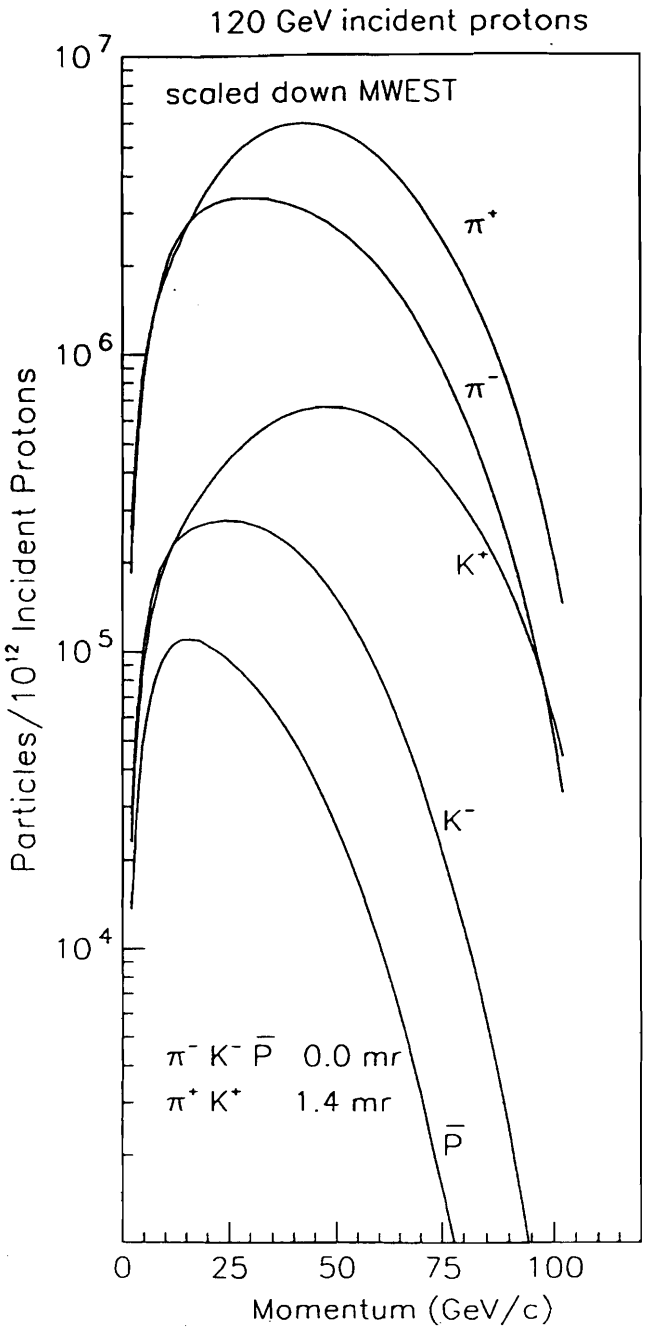

Figure 13. Main Injector: Fluxes scaled from the 800 GeV MW beamline.

SECTION IV. FERMILAB COMPUTING FACILITIES

The computing services provided for high-energy physics by the Computing Division focus on solving large physics problems (such as event reconstruction, Monte Carlo, and accelerator and magnet design) and providing support for experimental activities. The current emphasis is on systems required to reconstruct and analyze the data taken during the 1996-97 Fixed Target run, and on preparing for the 1999 Fixed Target run (FT99) and Collider Run II. Other projects at the Laboratory have large computing needs as well, and systems are available for them to use.

The systems currently supported centrally by the Computing Division include the Unix farms, FNALU (interactive and batch), CDF and D0 central computing systems, and KTeV and Sloan Digital Sky Survey central systems. Many of these systems are housed in the Feynman Computing Center.

FNALU is a cluster of Unix machines representing many of the supported Unix OS flavors of the laboratory. The cluster is used for 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. Figures 14 and 15 show the current configuration of FNALU and its utilization over the past four years. The multiprocessor farm systems composed of commercial workstations running Unix and PCs running Linux dominate the installed computing capacity at the Lab and allow fast cost-effective event reconstruction. The current capacity of the farms is approximately 30,000 MIPS. Figure 16 shows the growth in farms utilization since 1991 and a projection for Run II.

Approximately 1.2 terabytes of experimental data, the equivalent of about 240,000 8mm tapes, is currently stored in the Feynman vaults. In addition, tape libraries currently provide approximately 35 terabytes of robotically accessible tape storage. A new robotic facility with a projected capacity of at least 1600 terabytes will be provided for Run II. Figure 17 illustrates the growth of robotic tape mounts versus manual tape mounts in the Computing Center.

State of the art high-speed networks connect the systems together and to the outside world. The LANs (local-area networks) facilitate access to the data by people on site, and the WANs (wide-area networks) enable world-wide collaboration to function efficiently. A conceptual diagram of the Lab's networking infrastructure is shown in Figure 18.

The Computing Division plans to upgrade the facility's network backbone in 1999 to gigabit ethernet. Very high performance, multi-gigabit switch/routers will be installed at the core of the facility network to provide gigabit links for Run II and general-use computing resources, as well as to large, bandwidth-intensive work groups. Other major planned infrastructure enhancements include upgraded wiring at CDF and D0 for Run II, fiber cabling of additional floors in Wilson Hall, and fiber cabling within the Village lab area.

The Computing Division supports a data acquisition system, DART, which is in use in FT99, test beams, and collider experiments.

The Computing Division is significantly involved in planning, managing, writing software, and acquiring, installing and integrating hardware to acquire and analyze data from Collider Run II, starting in 2000. The data volume, CPU power, networking, etc. is expected to be a factor of 20 higher than Run I.

The Run II challenge has led to a new data handling model:

1) Write experimental raw data directly to robotic system (expected to be ~800 Terabytes per experiment).

2) Reconstruct physics objects using data in the robotic system.

3) Analyze directly from the robot.

4) Store summary data on disk (about 20 Terabytes per experiment).

FNALU configuration Dec. 1998
5800 MIPS

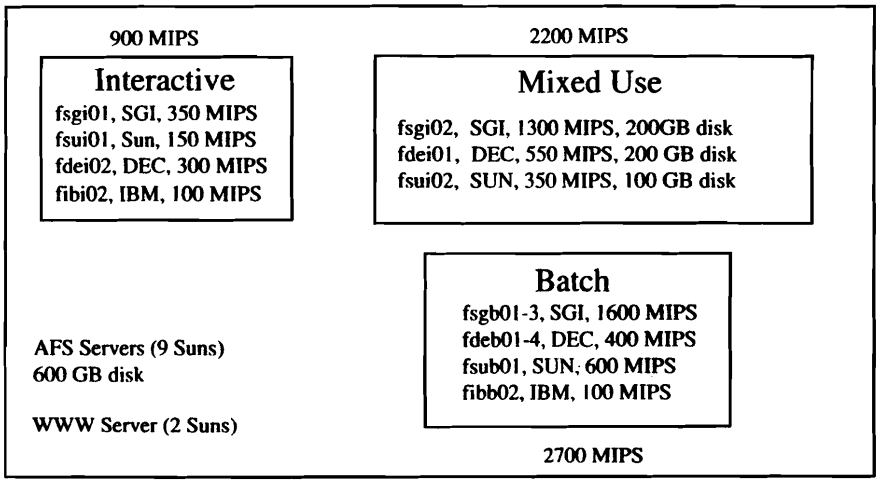

Figure 14. Current FNALU configuration.

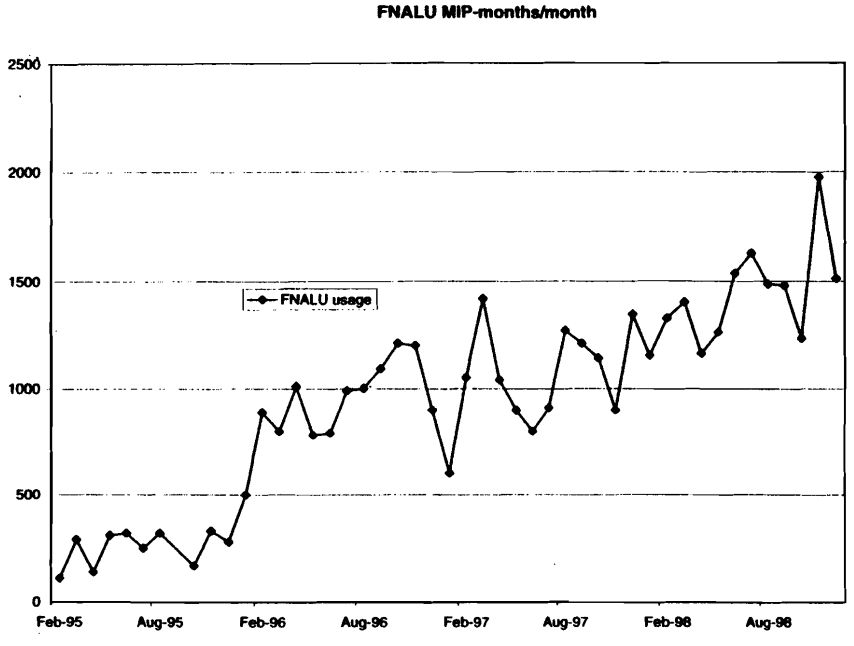

Figure 15. Computing delivered by FNALU in MIP-months/month 1995 through 1998.

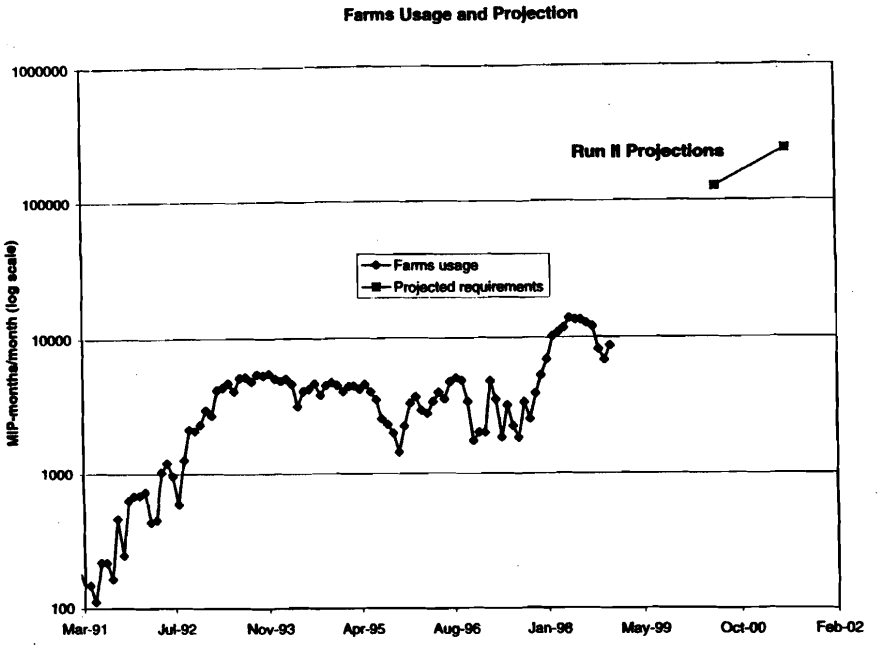

Figure 16. Growth in farms utilization since 1991.

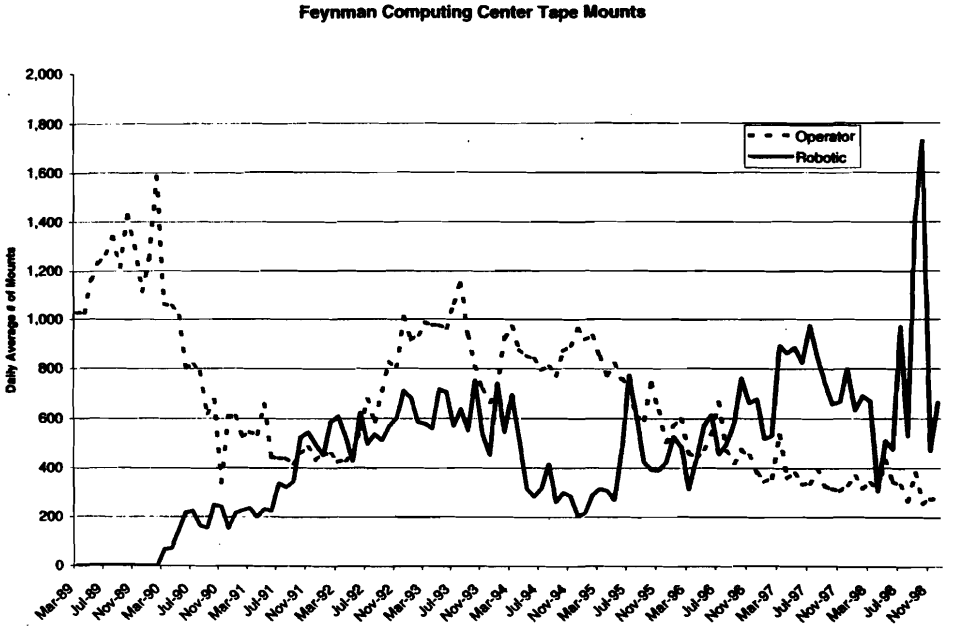

Figure 17. Growth of robotic tape mounts versus manual tape mounts.

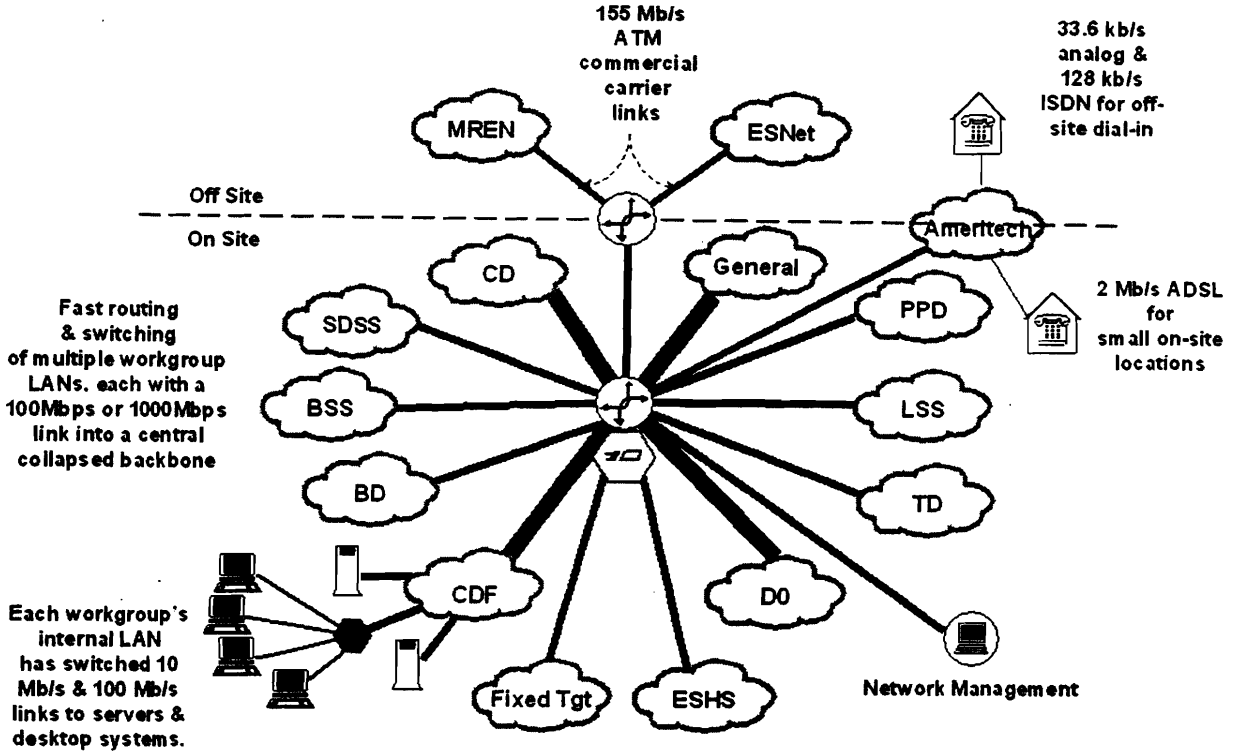

Figure 18. Conceptual diagram of Fermilab's networking infrastructure.

SECTION V. FERMILAB RESEARCH PROGRAM

This Section contains information on the Fermilab research program for the next few years. The Situation Report, given on pages 28-29, is a summary of the current status of the experimental program. Figure 19, based on the Situation Report, illustrates by beam line the major approved experiments that have not yet completed data-taking by the beginning of 1999.

Fermi National Accelerator Laboratory
Experimental Program Situation Report as of March 17, 1999

The Experimental Program situation at Fermilab is summarized below. The experiments are listed by experimental area and beamline under categories which best describe their status as of March 17, 1999. 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 - 437

Beam Area & Line	Experiment	Spokesperson(s)	
A. EXPERIMENTS THAT ARE COMPLETED (391)			**Completion Date**
(Note: Only experiments which were completed since January 1, 1999 are listed.)			
MA ME	B-QUARK MESONS & BARYONS #789	(Kaplan, Peng)	MAR 01, 1999
MP	POLARIZED BEAM #704	(Yokosawa)	MAR 01, 1999
MW	HADRON JETS #672A	(Zieminski)	MAR 01, 1999
	DIRECT PHOTON PRODUCTION #706	(Slattery)	MAR 01, 1999
NA NM	TEVATRON MUON #665	(Schellman)	MAR 01, 1999
NE	PARTICLE SEARCH #690	(Knapp)	MAR 01, 1999
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
ACCUM RING	CHARMONIUM STATES #760	(Cester)	MAR 01, 1999
B. EXPERIMENTS THAT ARE ANALYZING DATA (14)			**Last Run**
MA ME	ANTI(U-QUARK)/ANTI(D-QUARK) DIST#866	(Leitch)	AUG 06, 1997
MT	B PHYSICS TEST BEAM PROGRAM #T880	(Butler, Stone)	MAY 19, 1997
MW	COSMIC RAY CALORIMETER CALIBRATION #T883	(Adams)	AUG 06, 1997
NA NC	NEUTRINO #815	(Bernstein, Shaevitz)	SEP 05, 1997
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	(Lundberg, Paolone)	SEP 03, 1997
COL B-0	CDF UPGRADE #775	(Bellettini, Carithers, Jr.)	FEB 20, 1996
	CDF HARD DIFFRACTION STUDIES #876	(Albrow)	FEB 20, 1996
C-0	TEVATRON CRYSTAL EXTRACTION #853	(Murphy)	FEB 20, 1996
D-0	D-0 DETECTOR #740	(Grannis, Montgomery)	FEB 20, 1996
E-0	PBAR P ELASTIC SCATTERING #811	(Orear)	FEB 20, 1996
ACCUM RING	ANTI-HYDROGEN DETECTION #862	(Christian)	SEP 18, 1997
	ANTIPROTON DECAY #868	(Geer)	JUL 24, 1995
C. EXPERIMENTS THAT ARE IN PROGRESS (7)			
MA MC	CP VIOLATION #871	(Dukes, Luk)	
NA NM	CP VIOLATION #799	(Arisaka, Tschirhart)	
	CP VIOLATION #832	(Blucher)	
ACCUM RING	CHARMONIUM STATES #835	(Cester, Pordes)	
OTHER	SEARCH FOR LOW MASS MONOPOLES #882	(Kalbfleisch)	
	SLOAN DIGITAL SKY SURVEY #885	(Kent)	
	DARK MATTER SEARCH #891	(Dixon)	
F. EXPERIMENTS TO BE SETUP WITHIN A YEAR (4)			
COL B-0	CDF UPGRADE #830	(Bedeschi, Goshaw)	
D-0	D-0 DETECTOR UPGRADE #823	(Montgomery, Weerts)	
A0 FACILITY	PICOSECOND X-RAY SOURCE #886	(Colestock, Melissinos)	
	PLASMA WAKE-FIELD ACCELERATOR TEST #890	(Rosenzweig)	

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(Continued)

G. OTHER APPROVED EXPERIMENTS (10)

COL B-0	CDF INNER SILICON AND TOF #909	(Bedeschi, Goshaw)
C-0	BTeV R&D #897	(Butler, Stone)
D-0	D-0 FORWARD PROTON DETECTOR #900	(Montgomery, Weerts)
D-0	D-0 SILICON TRACK TRIGGER #908	(Montgomery, Weerts)
MAIN INJECTOR	NEUTRINO OSCILLATIONS #875	(Wojcicki)
BOOSTR	MiniBooNE #898	(Conrad, Louis)
OTHER	AUGER PROJECT R&D #881	(Mantsch)
	CMS AT FERMILAB #892	(Green)
	LHC ACCELERATOR #893	(Strait)
	RECYCLER ELECTRON COOLING #901	(Nagaitsev)

PENDING PROPOSALS (15)

MA MT	DIAMOND DETECTOR TEST #911	(Stone)
	HADRON CALORIMETER TEST #912	(Kamon, Takeshita)
	TRD TEST #913	(Swordy)
UNSPEC BEAM	MUON COOLING R&D #904	(Geer)
MAIN INJECTOR	KAON PHYSICS AT MAIN INJECTOR #804	(Ray)
	P-BAR+NUCLEI STUDIES #888	(Viola)
	CPT TEST #894	(Thomson)
	RADIO COHERENCE TEST #896	(Besson)
	EXOTIC ATOMS #902	(Ivanov)
	CKM R&D #905	(Cooper)
	ANTI(U-QUARK)/ANTI(D-QUARK) DIST#906	(Geesaman)
	PARTICLE PRODUCTION #907	(Raja)
	SPIN@FERMI #910	(Krisch)
BOOSTR	TEST FOR ANTIHYDROGEN SPECTROSCOPY #903	(Mandelkern)
OTHER	AXION SEARCH #877	(Lee)

MESON AREA

MC	871 Dukes / Luk	UC/Berkeley, Fermilab, Guanajuato, IIT, Lausanne, LBNL, Michigan, South Alabama, Taiwan, Virginia	CP Violation

NEUTRINO AREA

NM	799 Arisaka / Tschirhart	Arizona, UCLA, UC/San Diego, Campinas, Chicago, Colorado, Elmhurst, Fermilab, Osaka, Rice, Rutgers, Sao Paulo, Virginia, Wisconsin	Rare Kaon Decays	832 Blucher	Arizona, UCLA, UC/San Diego, Campinas, Chicago, Colorado, Elmhurst, Fermilab, Osaka, Rice, Rutgers, Sao Paulo, Virginia, Wisconsin	CP Violation

COLLIDER

B 0	830/909 Bedeschi / Goshaw	ANL, Bologna, Brandeis, UCLA, Cantabria, Chicago, Duke, Fermilab, Florida, Frascati, Geneva, Glasgow, Harvard, Hiroshima, Illinois, IPP/Canada, ITEP, JINR, Johns Hopkins, Karlsruhe, KEK, Korea Nad. Coll. Lab., LBNL, Liverpool, Michigan, Michigan State, MIT, New Mexico, Ohio State, 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
D 0	823/900/908 Montgomery / Weerts	los Andes, Amsterdam, Arizona, BNL, Boston, Brown, Buenos Aires, UC/Berkeley, UC/Davis, UC/Irvine, UC/Riverside, CBPF, Charles, Czech Acad. Sci., Czech Tech, CINVESTAV, Columbia, Delhi, Fermilab, Florida State, Grenoble, IHEP/Beijing, IHEP/Protvino, Illinois/Chicago, Imperial Coll., Indiana, INP/Krakow, Iowa State, ITEP, JINR, Kansas, Kansas State, Korea, Kyungsung, Langston, LBNL, Louisiana Tech, 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, Seoul National, SUNY/Stony Brook, Tata, Texas A&M, Texas/Arlington, Washington	D0 Detector

ACCUMULATOR

	835 Cester / Pordes	UC/Irvine, Fermilab, Ferrara, Genova, Minnesota Northwestern, Torino	Charmonium States

BOOSTER

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

MAIN INJECTOR

Neutrino Beam	875 Wojcicki	ANL, Athens, Caltech, Fermilab, Harvard, IHEP/Beijing, IHEP/Protvino, Indiana, ITEP, JINR, Lebedev, LLNL, Minnesota, Oxford, Pittsburgh, Rutherford, Stanford, Sussex, Texas A&M, Texas/Austin, Tufts, Univ. Coll. London, Western Washington	Neutrino Oscillations

Figure 19. Fermilab experimental program. All major approved experiments that have not yet completed data-taking by the beginning of 1999 are shown here.

SECTION VI. SUMMARIES OF APPROVED EXPERIMENTS

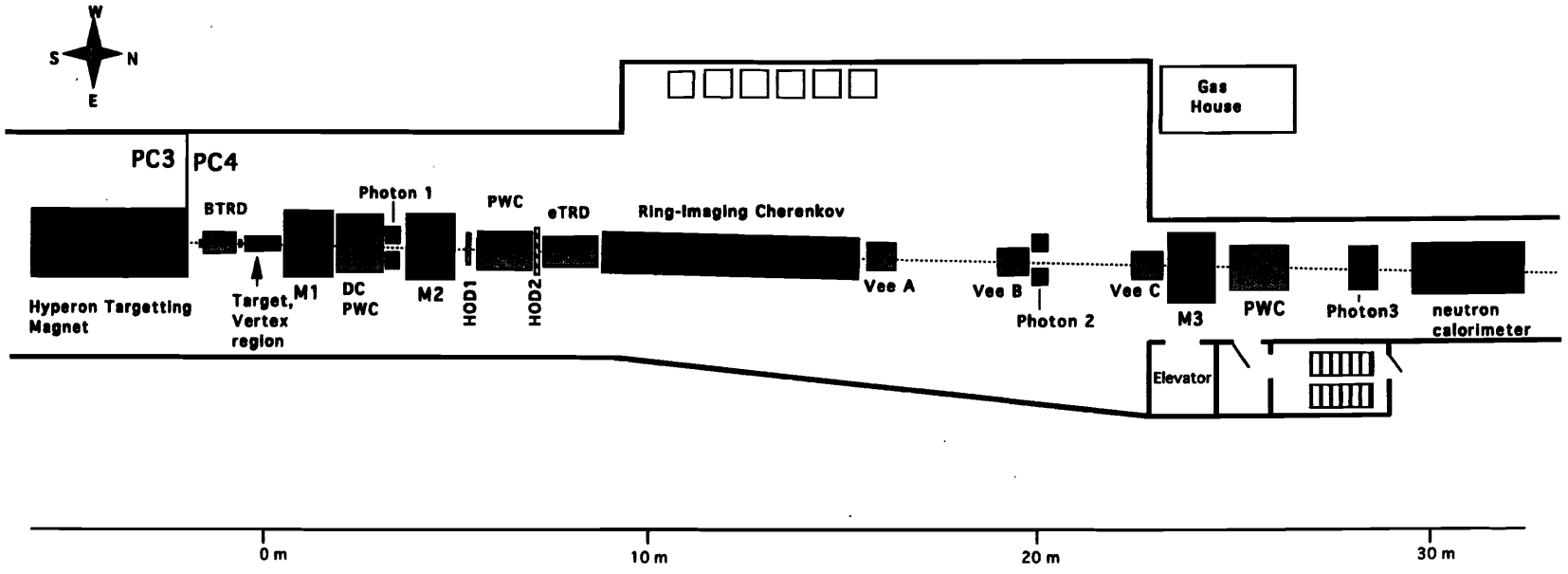
Summaries are given in this Section of major approved experiments which have not yet completed data-taking, and also those major experiments still carrying out a significant analysis effort. Most were prepared recently by the experiment spokesperson(s).

As in the past few Workbooks, now included in this Section are 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 given below, only the Fermilab physicists on these activities are included.

The number of users (physicists and graduate students) and institutions on the listed experiments are as follows; each user and institution is counted only once even if on more than one experiment.

	Number of Users	Number of Institutions
US institutions	1407	96
Non-US institutions	753	95

SELEX (E781)
Proton Center Layout



E-781 (Russ) Study of Charm Baryon Physics

Bogazici (Turkey), Bristol (Great Britain), 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 study of charm baryons has lagged behind the recent progress in charm meson physics. The production of baryons by electron colliders or photon beams is small compared to meson production. Sample sizes of charm baryons comprise a few thousand events, compared to the hundred thousand event samples for charm mesons. In photoproduction Λ_c^+ decays comprise most of the data. Present hadron data indicate larger production of c-s baryons in hadronic interaction, especially with hyperons. E-781 runs in a mixed hyperon/pion beam. Because hadronic production of charm remains a difficult experimental challenge, current generation experiments have tended to run "open" triggers. The charm states produced are preponderantly charm mesons near x = 0, the dominant cross section in all hadronic processes. The design philosophy for E-781 is to use the fact that for all known baryons, the baryon/meson ratio increases dramatically at large x. The overall charm production cross section decreases, of course, but a good charm trigger can produce an enriched sample of charm baryons.

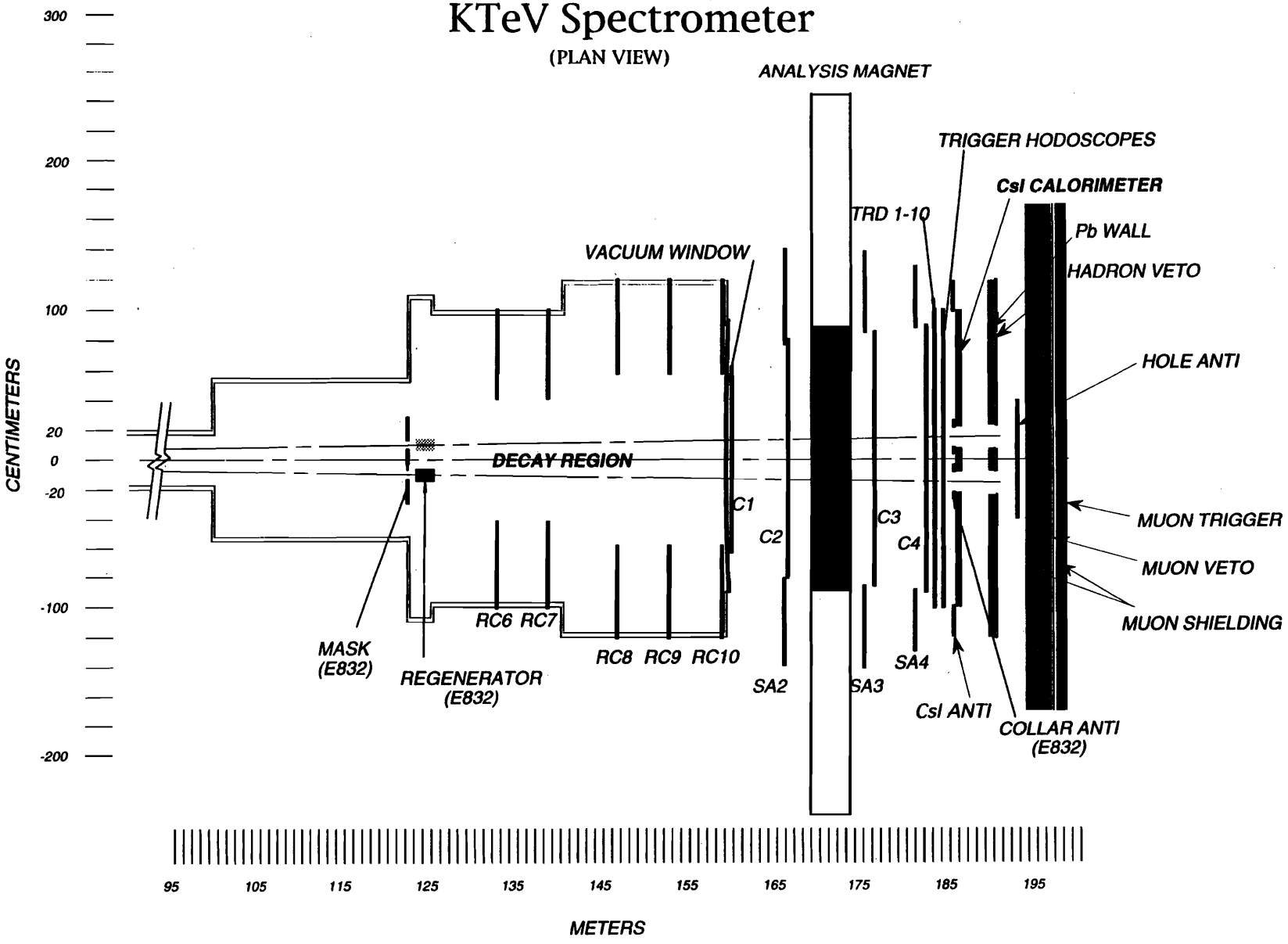
The charm trigger for E-781 is based on impact parameter, to provide a topology-independent trigger. All charm particles have a finite decay length, albeit short. A high resolution tracking device close to the target can select charm candidates on the basis of one or more tracks with a sufficiently large miss distance from the primary interaction point. Such a trigger is now conceivable because of recent advances in VLSI readout of silicon strip detectors and tremendous improvement in the online computer power available to an experiment. The spectrometer, shown in the accompanying figure, deploys a number of existing chambers and neutral particle detectors as well as the new silicon strip and pixel devices and the Ring-Imaging Cerenkov counter. By using VLSI amplifiers, E-781 can afford to make a vertex detector with 20 micron strips, totalling 50,000 channels of readout. They achieved 8-10 micron track spatial precision, and the large-x condition boosts all interesting tracks to high momentum (>15 GeV) to minimize multiple Coulomb scattering errors. The computational trigger for E-781 gives a charm reconstruction enrichment factor at large x of at least 10 compared to all interactions.

The physics questions for a charm baryon study have to do with both production and decay mechanisms. In charm baryon decays, the charm quark may decay or interact through exchange mechanisms with the light

quarks. The exchange mechanisms are not suppressed by helicity considerations as they are in meson decays. A rich spectrum of two-body resonances may dominate the final states. Do they? The discovery of resonance-dominance of charm meson final states was a surprise, and the study of decay modes in baryons is an important goal of E-781. Such a study requires good particle identification and also good photon detection. We have both. Comparison of non-leptonic and semi-leptonic modes is also important. The transition radiation detector in front of the Ring-Imaging Cerenkov is a clean tag on electrons. From a theoretical point of view, understanding the ordering of the decay rates of the four different stable charm baryons will give useful insight into which of the several competing decay mechanisms dominates these states. All these data will provide useful tests of the first-order corrections to Heavy Quark Effective Theory. For $c \rightarrow s$ transitions, details of the model can be probed.

Strong interaction physics can be studied in the production of charm baryons. The observation of a p_t-dependent polarization in the production of strange baryons has led to a resurgence of interest in spin-effects at high energies. What happens with charm baryons? E-781 will measure polarizations. There is evidence for leading production of charm baryons from some experiments, but this is not universally observed. E-781 will do a detailed x-dependence measurement of charm baryon production from several different incident beams.

The physics potential of the experiment touches many little-known areas of heavy quark physics. The focus on baryons is especially appropriate for a hadron machine. The experiment operated in the 1996-97 fixed-target period and recorded 24 billion inelastic interactions. Analysis is now underway.


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

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

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

Status: *E-799 Phase I - Data Analysis*
E-799 Phase II - Data-Taking
E-832 - Data-Taking

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 $K_{L,S} \rightarrow 2\pi$).

E-799 is an experiment to search for rare K_L decays, such as $K_L \rightarrow \pi^0 l^+ l^-$ (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
$\pi^0 \rightarrow ee$	$(7.6\ ^{+3.9}_{-2.8} \pm 0.5) \times 10^{-8}$	PRL 71, 34 (1993)
$K_L \rightarrow \pi^0 ee$	$< 4.3 \times 10^{-9}$	PRL 71, 3918 (1993)
$K_L \rightarrow \pi^0 \mu\mu$	$< 5.1 \times 10^{-9}$	PRL 71, 3914 (1993)
$\pi^0 \rightarrow \mu e$	$< 8.6 \times 10^{-9}$	PL B320, 407 (1994)
$K_L \rightarrow eeee$	$(3.96 \pm 0.78 \pm 0.32) \times 10^{-8}$	PRL 72, 3000 (1994)
$K_L \rightarrow \pi^0 \nu\bar{\nu}$	$< 5.8 \times 10^{-5}$	PRL 72, 3758 (1994)
$K_L \rightarrow \pi^0 \pi^0 \gamma$	$< 2.3 \times 10^{-4}$	PR D50, 1874 (1994)
$K_L \rightarrow ee\gamma\gamma$	$(6.5 \pm 1.2 \pm 0.6) \times 10^{-7}$	PRL 73, 2169 (1994)
Λ, $\bar{\Lambda}$ polarization		PL B338, 403 (1994)
$K_L \rightarrow \mu\mu\gamma$	$(3.23 \pm 0.23 \pm 0.19) \times 10^{-7}$	PRL 74, 3323 (1995)
$K_L \rightarrow ee\mu\mu$	$(2.9\ ^{+6.7}_{-2.4}) \times 10^{-9}$	PRL 76, 4312 (1996)
$K_L \rightarrow \pi^0 \mu e$	$< 3.2 \times 10^{-9}$	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). Although there is considerable uncertainty in the predictions for the size of ε'/ε in the standard model, this measurement would severely constrain the models and, if non-zero but small ($<10^{-3}$), would give an important new "handle" on the phenomenon of CP violation, even with the discovery of "top" in the Tevatron Collider.

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 (rare K decay experiment), 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.

A KTeV Design Report (FN-580) was prepared for the project. A new KTeV experimental hall has been completed at the NM4 enclosure in the NM beamline and was operational in 1996. The experiment took data in the 1996-97 fixed-target run.

A 10-month run of data-taking ended in early September 1997. The E-832 data for ε'/ε were accumulated in the fall of 1996 and spring 1997 between April and July. Among a large sample of raw data collected (about 50 Terabytes) on tape, we estimated about 4M events are CP-violated $K_L \rightarrow \pi^0\pi^0$ after preliminary offline cuts, an order of magnitude improvement over the previous experiment E-731. This data sample should result in a statistical uncertainty of around 1.5×10^{-4} on ε'/ε; we hope to reduce the systematic error to about half of the statistical error, although achieving this goal may require several years' effort.

E-799 Phase II data were collected from mid-January to late March 1997 and again for about a month in August at the end of the 1997 run with the KTeV spectrometer and CsI calorimeter. The clean beam and new data acquisition system allow us to run at higher proton beam intensity and trigger acceptance. The CsI calorimeter offers a far better energy resolution to reduce major backgrounds in rare decays. New TRD modules give signficant e/π separation (~150:1) for background rejection. New photon veto counters have better coverage to reduce backgrounds caused by escaping photons. With all these combined, E-799 Phase II is planning to improve the sensitivity for many rare decays by two orders of magnitude compared to Phase I.

Several preliminary results from E-799 and E-832 data were analyzed before the run was over, such as a new limit on $K_L \rightarrow \pi^0\nu\nu$ from a one-day single beam special run; a light gluino search - the R^0 production limit (now published in PRL); the first discovery and branching ratio of $K_L \rightarrow \pi^+\pi^-e^+e^-$ decays; the first discovery of Ξ^0 β-decay and measurement of its branching ratio; a clean signal in Ξ radiative decay. The data sample for those analyses range from one day to several weeks of data. We have also studied many other modes, as in Phase I, with at least one day's data during the run.

KTeV is planning to take more data in 1999 for both ε'/ε and rare K decay search programs to reach or exceed the current physics goals in the proposal.

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).

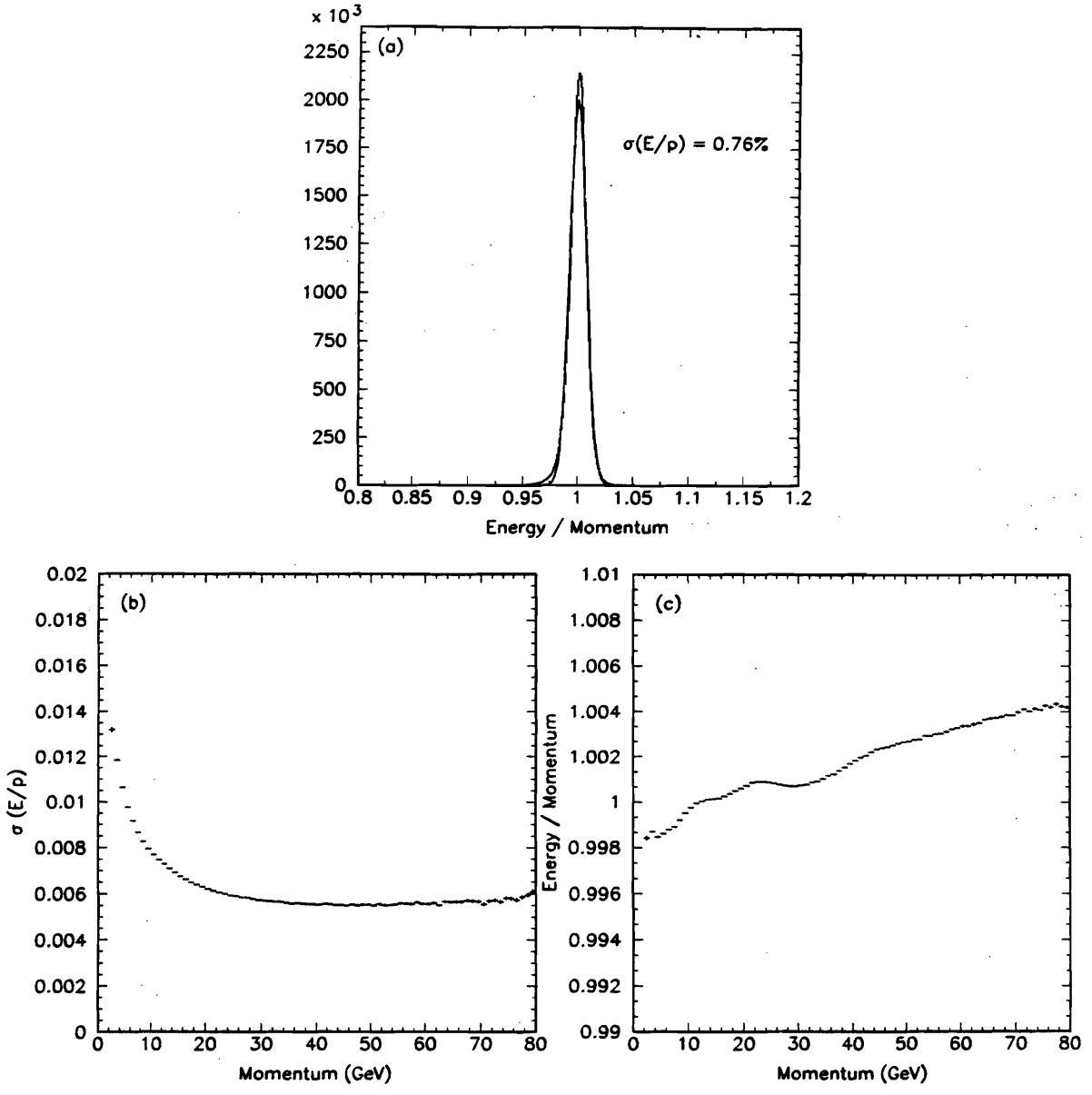


Figure 1. (a) Measured E/p (calorimeter energy / spectrometer momentum) for a sample of electrons from $K_L \rightarrow \pi^+ e^- \nu$ events; (b) σ(E/p) versus momentum for these electrons; (c) Measured E/p versus momentum for these electrons.

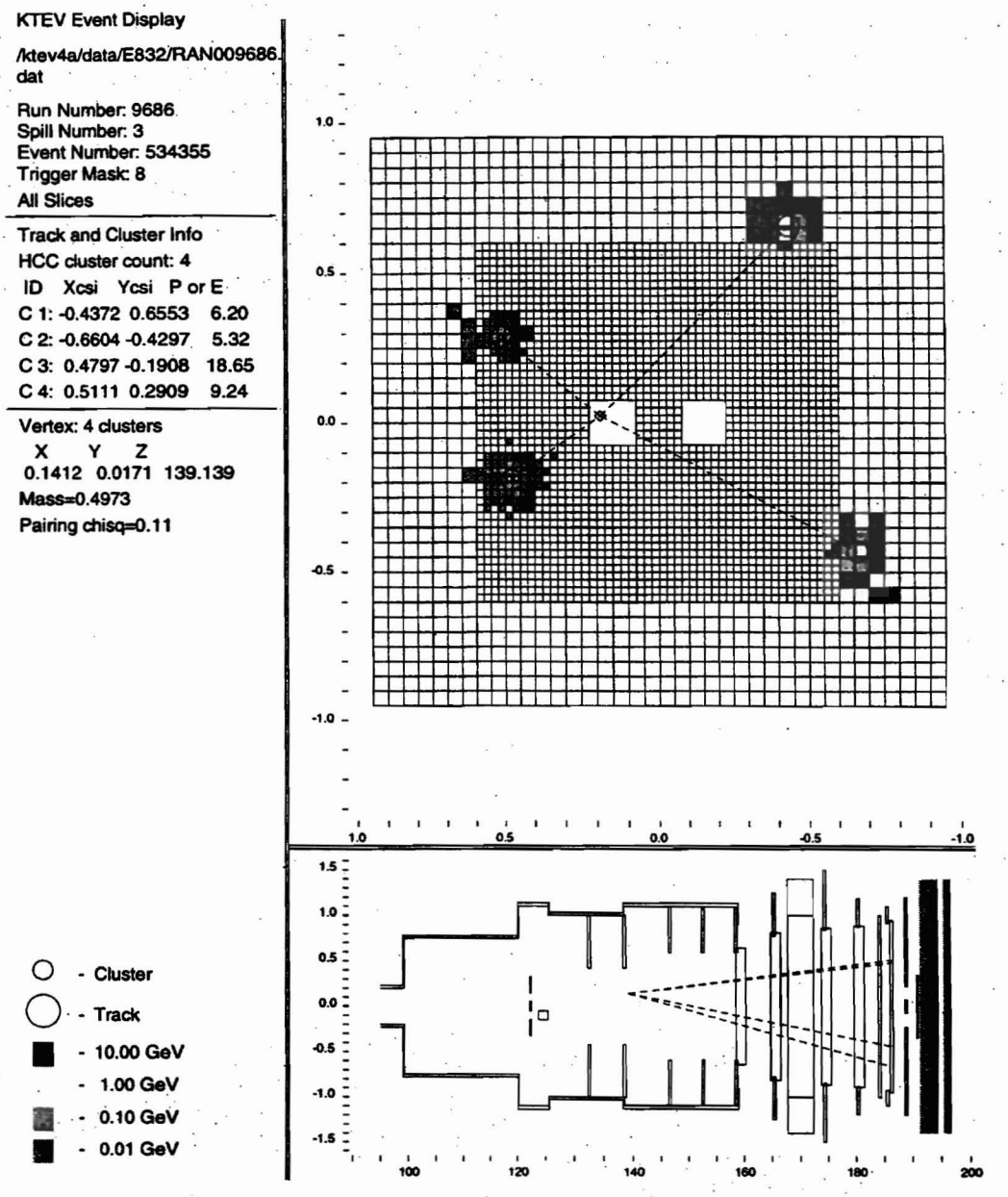


Figure 2. A typical online event display of a $K \rightarrow 2\pi^0$ decay.

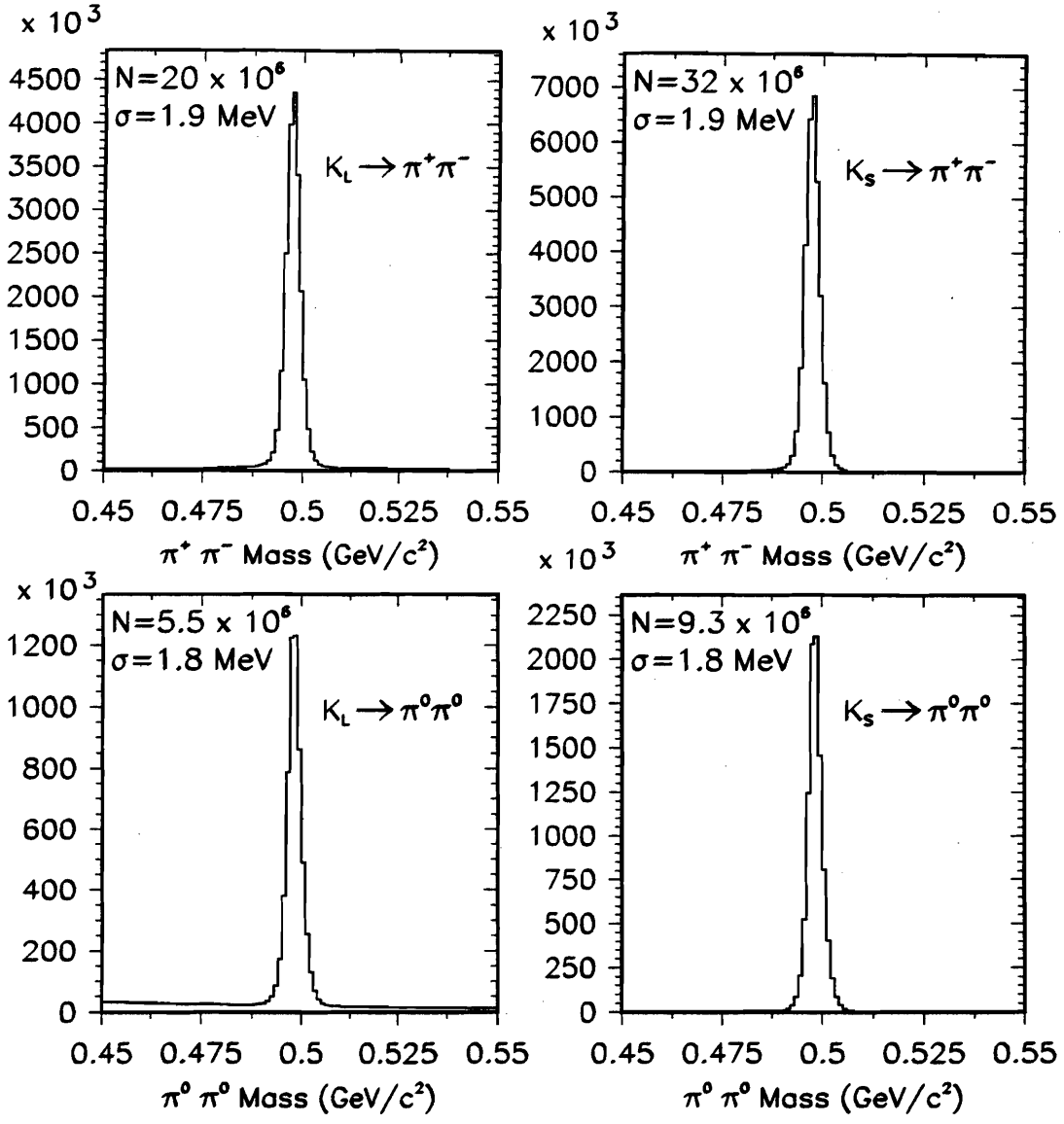


Figure 3. Online invariant-mass plots from the entire E-832 run for $K \to \pi^+\pi^-$ (top) and $K \to \pi^0\pi^0$ (bottom) for vacuum (left) and regenerator (right) beams.

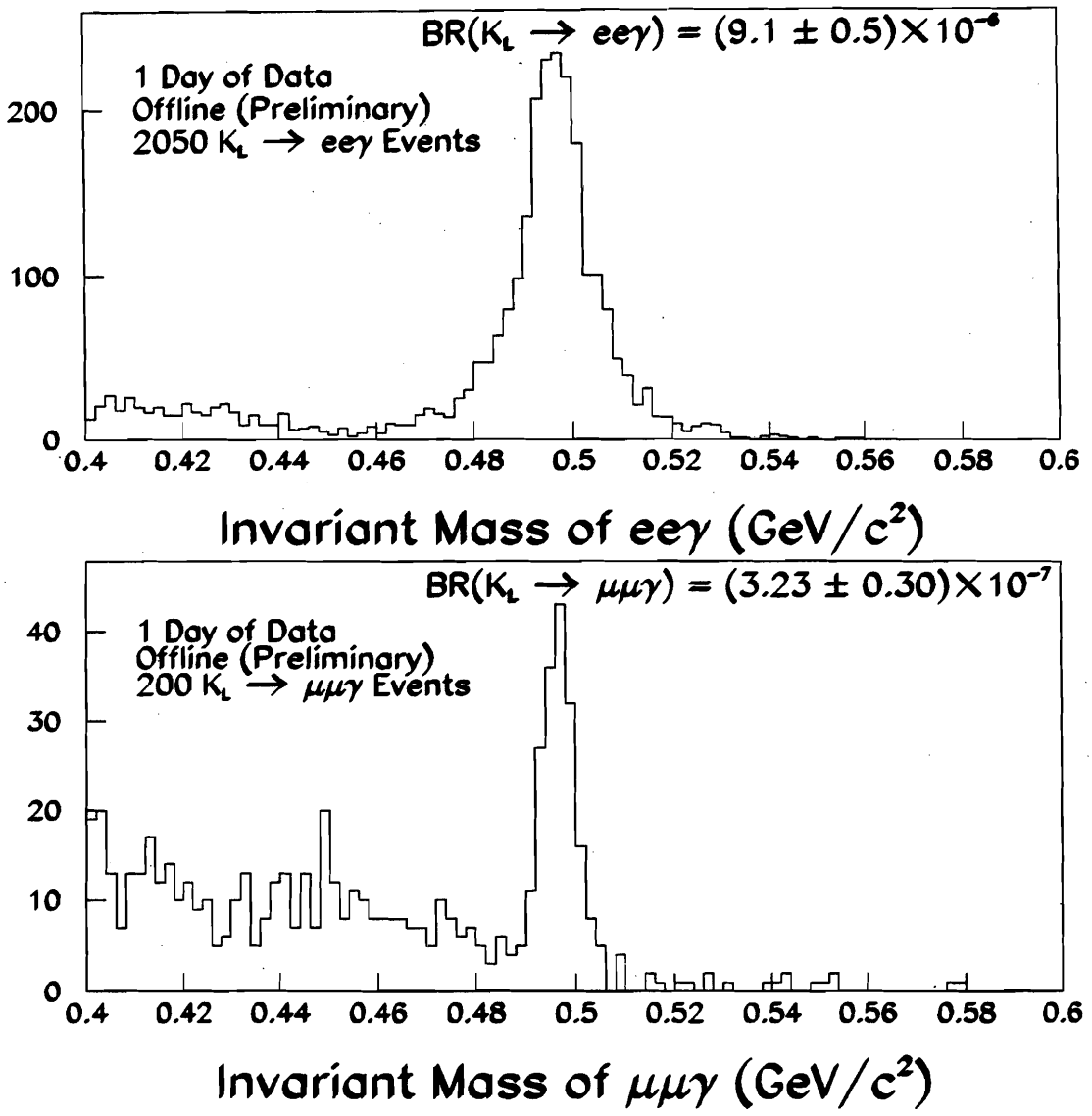


Figure 4. K_L Dalitz decay yields from the one-day analysis.

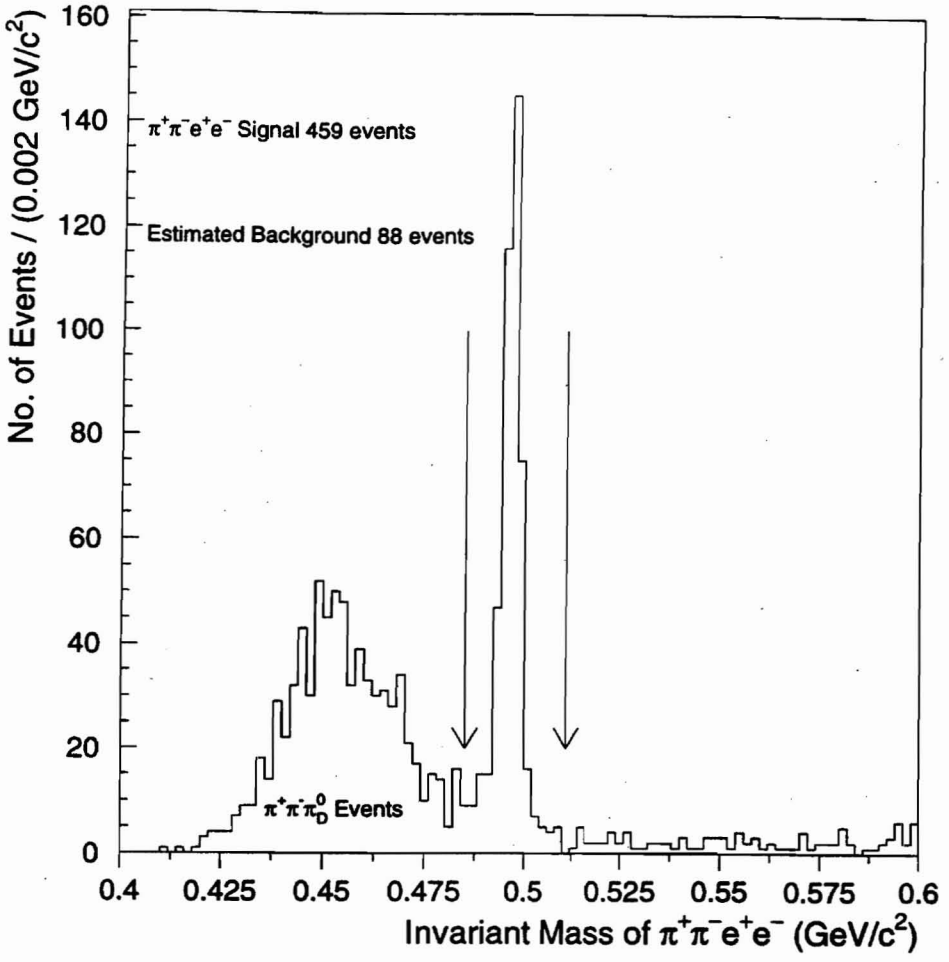


Figure 5. $K_L \rightarrow \pi^+\pi^-e^+e^-$ mass peak from the three-week data set.

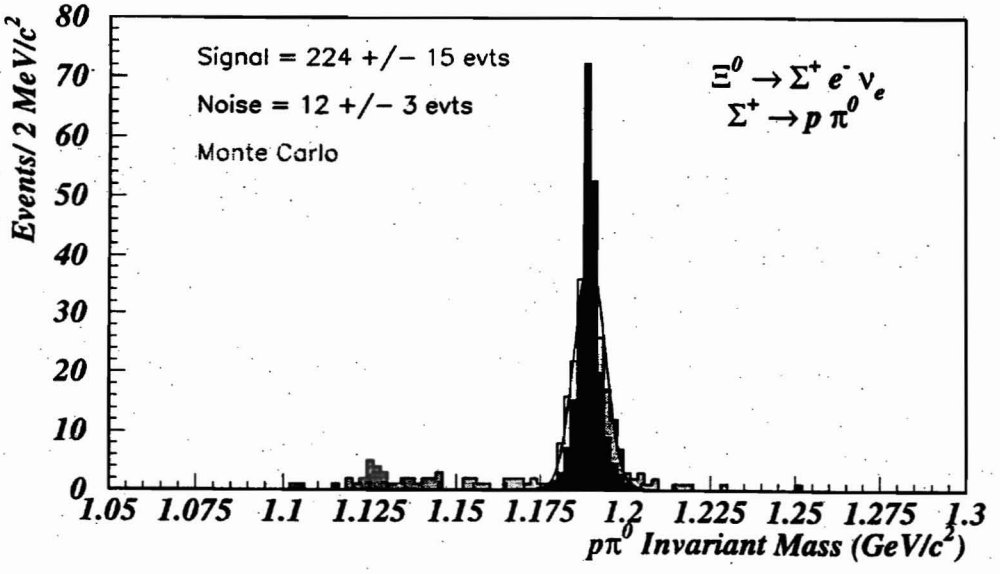
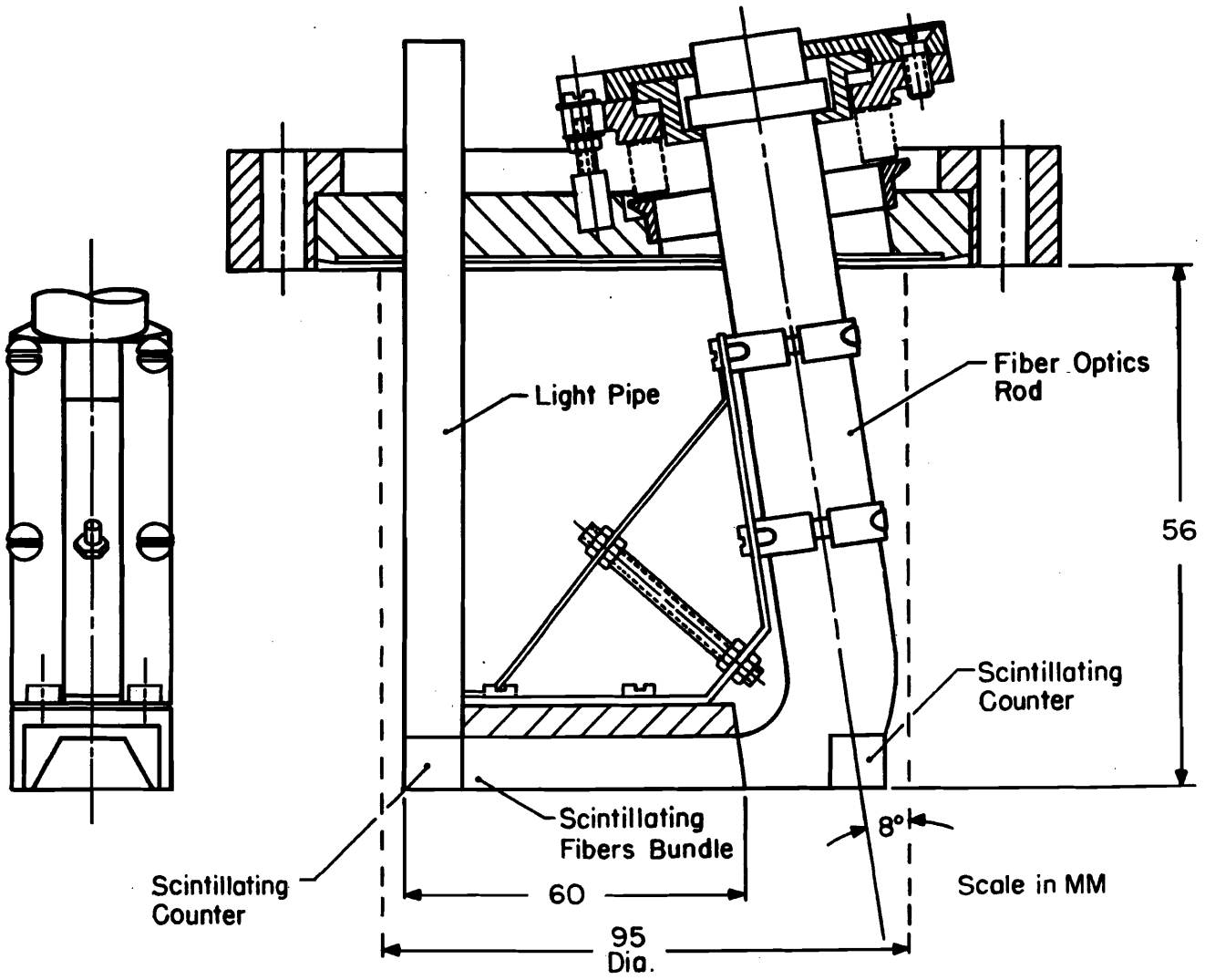


Figure 6. Evidence for the first observation of $\Xi^0 \rightarrow \Sigma^+e^-\bar{\nu}$, with $\Sigma^+ \rightarrow p\pi^0$. The reconstructed mass is plotted along with a Monte Carlo overlay (dark region).


Light Pipe
Fiber Optics Rod
56
Scintillating Counter
Scintillating Fibers Bundle
8°
Scintillating Counter
60
95 Dia.
Scale in MM

E-811 (Orear) Physics at E0 for Collider Run Ib

CERN, Cornell, Fermilab

Status: *Data Analysis*

The goals are two-fold: (1) to get new, accurate values of the rho value (ratio of real to imaginary part of the forward scattering amplitude) and total cross section at the full collider energy, and (2) to test out a new detector scheme designed to do the same thing at a higher energy collider. These new detectors are designed to measure very small angle elastic scatterings within a millimeter or two of the beam. They consist of bundles of 100 micron scintillating fibers lined up parallel to the beam and remotely adjustable in position. Light generated in a scintillating fiber is led outside the vacuum tank by glass fiber optics undergoing a 90 degree bend to a series of two image intensifiers. The image on the final phosphor is registered on a CCD, digitized, and dumped onto data tape after an appropriate trigger. The voltage signal on the final phosphor allows it to behave as the anode of a photomultiplier tube and can be used as part of the trigger. This new detector has been tested in a 10 GeV pion beam at CERN and found to be 100% efficient with zero background, both for the CCD image and the fast pulse obtained from the anode. Such a detector is equivalent to a bundle of 15,000 independently readable scintillation counters, each with 100% efficiency, with zero noise, no cracks, and position resolution in both dimensions of about 30 microns. In the actual data-taking run of January 1996, close to 100% efficiency was obtained for each detector, and position resolution of ~30 microns was also obtained.

Four such detectors were installed at the same far positions used by E-710. During the shutdown between Runs Ia and Ib one such detector had been installed and shown to work in the beam pipe vacuum. In E-710 the detectors were able to get within 2.2 mm of the beam without running into too much background. Analysis of simulated data has shown that if these new detectors can take data down to 2.9 mm of the beam then the rho value can be obtained to an accuracy of 0.03 and the total cross section to 1.5 mb. This is based on a sample of 80,000 elastics in the low-t geometry which is what was obtained in the January 1996 run. Data-taking was with separators off and highly scraped beam. A final value for the total cross section has been obtained and has been published in Physics Letters B. This measurement is of significantly greater accuracy than E-710 or CDF. Data analysis for obtaining the ρ value is now in progress.

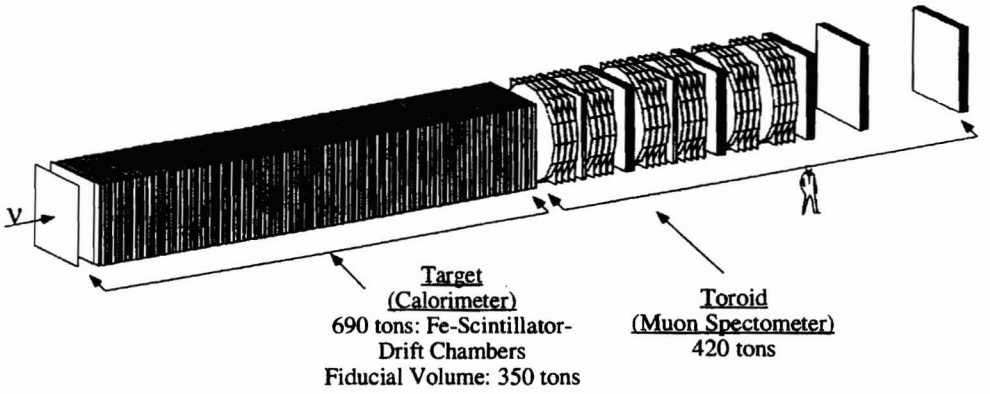
Publication

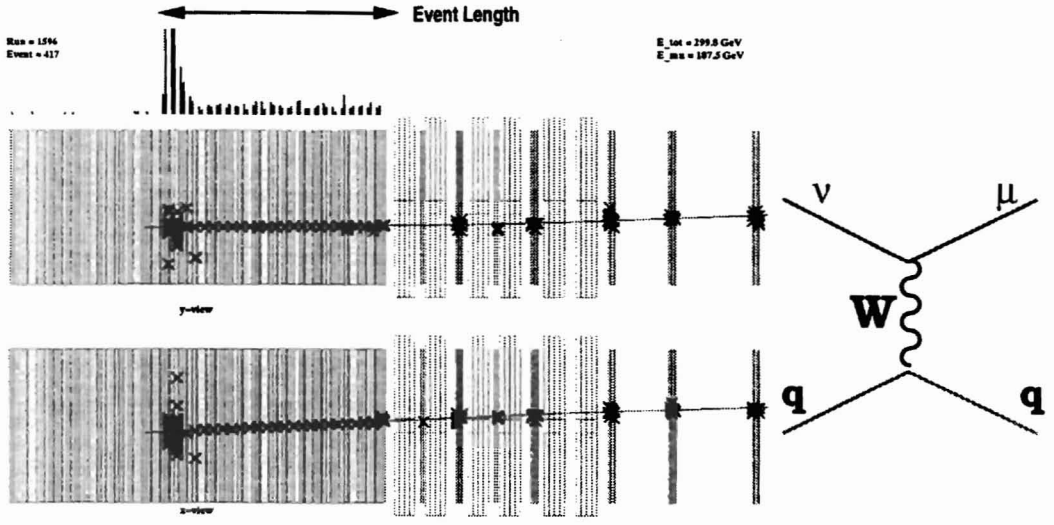
A Measurement of the Proton-Antiproton Total Cross Section at $\sqrt{s}$ = 1.8 TeV, C. Avila et al., Phys. Lett. B445, 419 (1999).

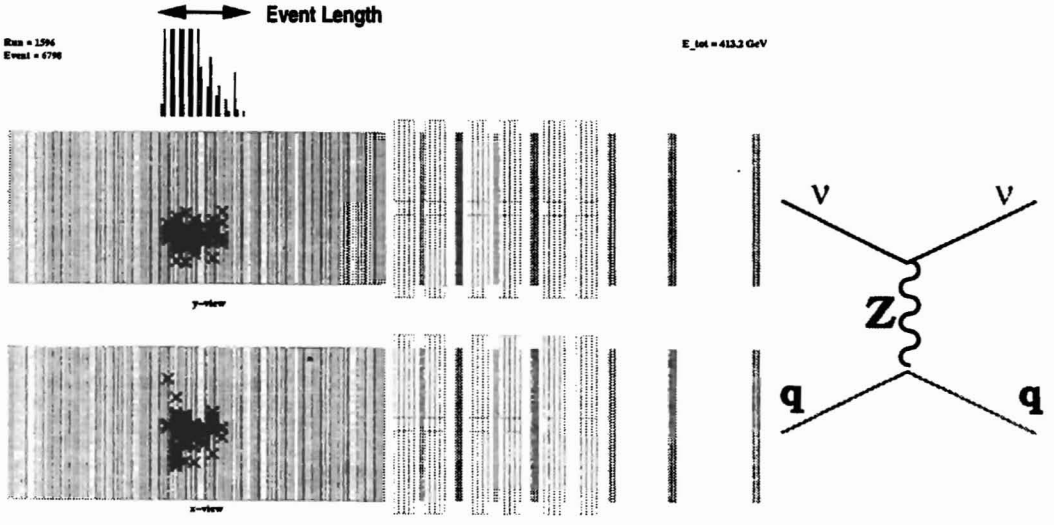
Thesis

C. Avila, Cornell University, 1997.

E-815


ν
Target
(Calorimeter)
690 tons: Fe-Scintillator-
Drift Chambers
Fiducial Volume: 350 tons
Toroid
(Muon Spectometer)
420 tons


Event Length
ν
μ
W
q
q


Event Length
ν
ν
Z
q
q

E-815 (Bernstein / Shaevitz) Precision Measurements of Neutrino Neutral- and Charged-Current Interactions Using a Sign-Selected Beam

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

Status: *Data Analysis*

Neutrino-nucleon collisions have in the past provided the most precise measurements of the electroweak mixing angle, θ_W. With the discovery of the top quark, these measurements along with those at colliders have led to important tests of the Standard Model through comparisons to predictions including electroweak radiative corrections. The incomplete nature of the Standard Model inspires further theoretical and experimental effort to make even better precision tests, and the departure of a precisely measured Standard Model parameter from its predicted value would provide a clear indication of new physics.

E-815 (NuTeV) exploits the full power of the high-energy, high-intensity Tevatron neutrino beam to significantly improve upon the past precision of the electroweak parameters. The new Sign-Selected Quadrupole Train (SSQT) has enabled us to unambiguously distinguish neutrino and anti-neutrino interactions with at least two significant results:

(1) Previously limiting systematic errors on the determination of $\sin^2\theta_W$ have been eliminated or dramatically reduced.

(2) The ability to distinguish between neutrino and anti-neutrino interactions is allowing us to make the first precision measurement of ρ, the ratio of neutral- to charged-current coupling strengths.

Historically, the comparison of different measurements of the weak mixing angle in collider and fixed-target experiments has proven fruitful since each type of experiment has different sensitivity to the Standard Model radiative corrections which depend on the top quark and Higgs boson masses. Precision electroweak measurements had already predicted the top mass before its recent discovery, and further increases in precision may uncover mass effects due to the existence of yet undiscovered particles such as the Higgs boson or supersymmetric particles. The value of ρ reflects the structure of the Higgs sector so a precise determination is a powerful probe of the nature of electroweak unification.

The NuTeV data analysis has gone well and has already met the goal of a measurement of $\sin^2\theta_W$ with an expected total error of $\pm$ 0.0025. A preliminary result,

$$\sin^2\theta_W = 0.2253 \pm 0.019(\text{stat.}) \pm 0.010(\text{syst.}),$$

was presented at the Moriond conference in 1998 showing that the experiment has succeeded in reducing the systematic error to below the statistical uncertainty. This result corresponds to a W-mass measurement of

$$M_W = 80.26 \pm 0.11 \text{ MeV/c}^2$$

which is competitive and complementary with collider measurements. Over the next year, analysis exploiting neutrino and antineutrino data separately will provide one of the precision measurements of ρ, the neutral to charged current coupling strength, with an error of ± 0.010. Neutrino-nucleon scattering measurements have a unique dependence on the radiative corrections and are the only measurements which directly determine both $\sin^2\theta_W$ and ρ.

Neutrino-nucleon scattering has always been a rich source of information on the structure of nucleons and tests of QCD, and NuTeV will build on that tradition. Experience gained in E-744/E-770 is being used to reduce the systematic errors on α_s and Λ_{QCD} through the use of an extensive calibration program with a new precision test-beam. E-744/E-770 has already provided the best measurement of strong coupling constant, $\alpha_s(M_z)$, with the limiting error being the comparison of the energy scales of the calorimeter hadron measurement and toroid-spectrometer muon measurement. NuTeV has reached a calibration accuracy three times better than that of E-744/E-770 that should translate into significantly better structure function and strong coupling measurements.

With the large, very pure statistical samples of both neutrinos and antineutrinos combined with the very complete test-beam data, NuTeV will be able to make important physics measurements in the following areas:

a) Measurements of the strange quark sea and the charm quark mass from studies of neutrino/antineutrino charm production.

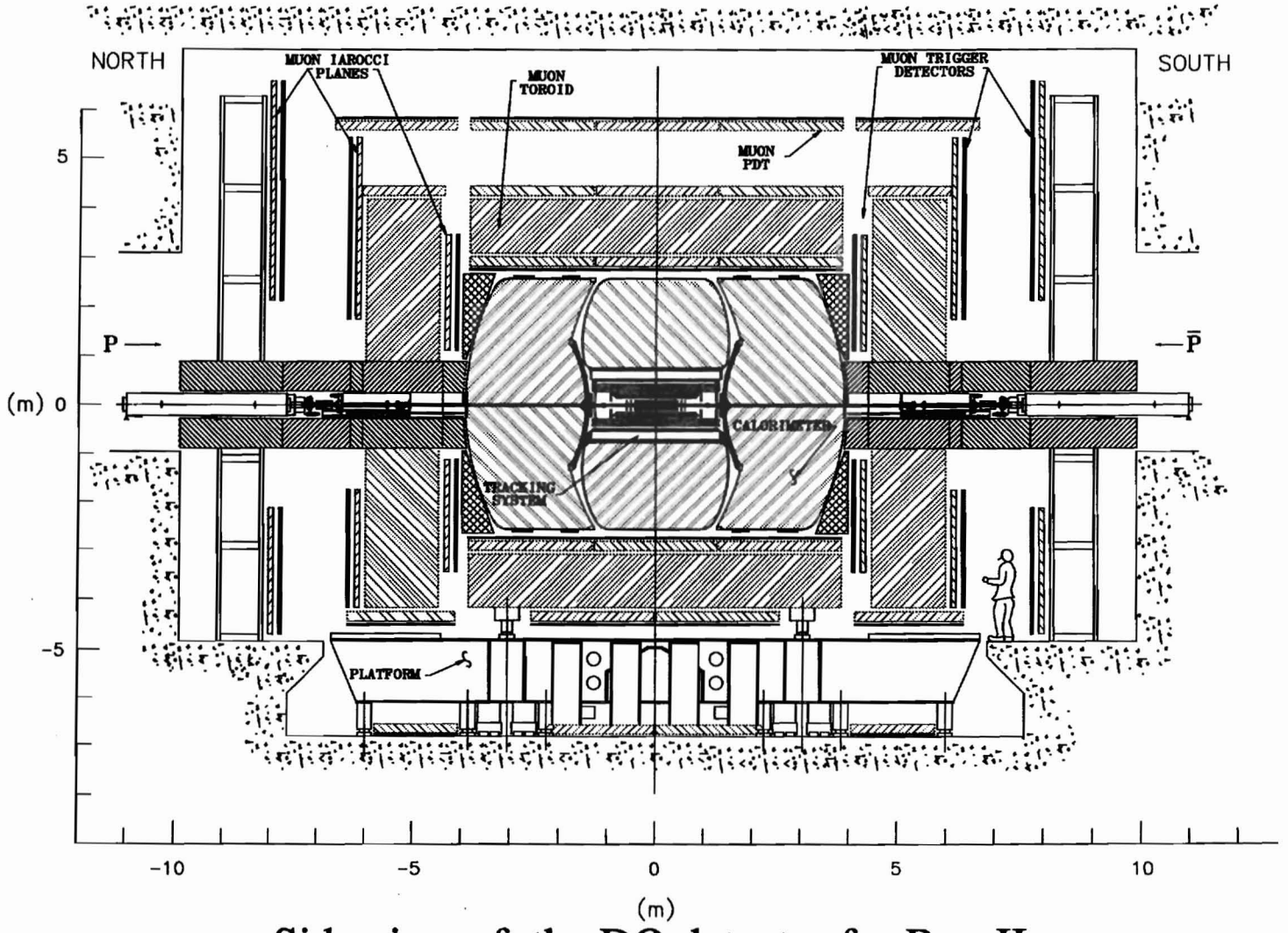
b) Measurements of the charm-quark sea from studies of wrong-sign single muon production by neutrino neutral-current scattering off the charm sea.

c) Searches for neutrino oscillations using the measured neutral current rate or the appearance of ν_e's in the pure ν_μ beam.

d) Measurements of the purely leptonic process, $\nu_\mu + e^- \rightarrow \mu^- + \nu_e$, and searches for lepton number violation.

e) Searches for neutral, heavy leptons decaying in the Lab F "Decay-Channel" detector.

Preliminary results on these topics have been presented at conferences over the last six months and journal publications are expected to be available over the next year.



Side view of the DØ detector for Run II

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

Acad. Sci. (Czech Rep.), Amsterdam (Netherlands), los Andes (Colombia), Arizona, BNL, Boston, Brown, Buenos Aires (Argentina), UC/Berkeley, UC/Davis, UC/Irvine, UC/Riverside, CBPF (Brazil), Charles (Czech Rep.), Czech Tech (Czech Rep.), CINVESTAV (Mexico), Columbia, Delhi (India), Fermilab, Florida State, Grenoble (France), IHEP/Beijing (China), IHEP/Protvino (Russia), Illinois/Chicago, Imperial College (England), Indiana, INP/Krakow (Poland), Iowa State, ITEP (Russia), JINR (Russia), Kansas, Kansas State, Korea (Korea), Kyungsung (Korea), Langston, LBNL, Louisiana Tech, Manchester (England), 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), Seoul National (Korea), SUNY/Stony Brook, Tata (India), Texas A&M, Texas/Arlington, 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 1.8 TeV at the Fermilab Tevatron Collider. The detector stresses identification of leptons, photons, jets and missing transverse energy for high-p_T physics with high acceptance up to pseudorapidity of $|\eta| < 3$ for electrons and muons. After five years in the construction phase, the detector has been operated since 1992 by a collaboration now totaling 49 institutions within the U.S. and overseas, with over 450 Ph.D. physicists and graduate students, to study a variety of particle physics topics with the top search as perhaps the most visible example.

The detector used in Run I consisted of three major subsystems. Innermost is a central tracking system containing vertex, forward and central drift chambers. There was no central magnetic field. The drift chamber resolution is ~60 μm (vertex) and 180 μm (forward and central). The tracking system also included a transition radiation detector to aid in electron identification; it provided a rejection of about 50 against single pions. The tracking chambers were surrounded by a hermetic liquid argon sampling calorimeter with uranium and copper/steel absorber. The calorimeter is contained in three cryostat vessels (a central barrel and two end caps). The calorimeter is compensating (e/π ~1.05) and finely segmented to identify electrons, photons, muons and jets. The electromagnetic (EM) calorimeter covers $|\eta| < 3$ and hadronic calorimetry extends to $|\eta| < 4.4$; this large acceptance provides excellent measurement of missing transverse energy. The segmentation is $\Delta\eta \times \Delta\phi = 0.1 \times 0.1$ (0.05×0.05 at EM shower maximum); the energy resolution is $\sim 15\%/\sqrt{E}$ for electrons and photons (with a small constant term), $\sim 50\%/\sqrt{E} \oplus 5\%$ for single hadrons, and about $85\%/\sqrt{E}$ for jets. Outside the calorimeter cryostats was a muon system comprising three layers of

proportional drift tubes (0.3 mm resolution) with magnetized iron toroids to provide muon momentum measurement. In the forward regions a small angle muon spectrometer (200 μm resolution) extends coverage up to $|\eta| < 3.3$.

The detector as a whole contained 116,000 channels. Data recording was initiated by a three-level trigger system: the first (Level 0) was a scintillator interaction trigger, the second (Level 1) a hardware analog trigger capable of making calorimeter energy sums, missing E_T, and coarse muon tracks, and the third (Level 2) was a software filter implemented on a farm of 48 VAX Station 4000 computers with full event information available. A supplementary Level 1.5 trigger refined the Level 1 muon and electron trigger.

Initial running concentrated on commissioning the apparatus and understanding the effects of the Main Ring beam which passes through the calorimeter 2m above the Tevatron beam. First collisions were observed on May 12, 1992 and the data run started after a brief shutdown in August. Over the whole of Run Ia, D0 accumulated $15pb^{-1}$ of collider data including special and calibration data runs. The overall ratio of beam data recorded to beam available was about 70%, with the main loss coming from the veto imposed to stop triggering during Main Ring injection and transition and while Main Ring protons pass through the detector. Data were taken at a rate of about 2 Hz and reconstructed at the same rate on a multi-processor UNIX farm.

D0 is now finished taking data in Run I. The detector was improved for the higher luminosities compared with Run Ia by the addition of a cosmic ray shield for the muon system and hardware Level 1.5 trigger for electrons capable of performing both threshold and simple isolation cuts. The total data to tape for Run I corresponded to ~120 pb^{-1}.

Current Ia and Ib physics analyses at D0 are organized into five groups. The Top Quark Group was able to set a mass limit of $m_t > 131$ GeV using Run Ia data. With the larger statistics available from Run Ib, we reported observation of the top quark in February 1995. This was a major accomplishment in understanding the Standard Model. During 1997, we presented a measurement of the top mass of $172.0 \pm 5.1 \pm 5.5$ GeV by combining the lepton + jet and dilepton final states. In 1998 we have presented measurements of the cross section using the all-jets final state.

The QCD Group has presented cross sections for inclusive jets in the central and forward regions and differential cross sections for dijet production. The dijet angular distributions have been measured, and photon cross sections and angular distributions presented. Many new analyses have extended the study of QCD at the Tevatron Collider into new regimes: the reported observation of rapidity gaps between forward and backward jets is a signal for colorless exchange, e.g. pomerons; the decorrelation in azimuthal angle between forward and backward jets allows tests of resummation in mixed-scale problems; measurement of energy flow around jets allows the color coherence of gluon emission to be probed. The final results on the central inclusive jets cross section was submitted for publication in 1998.

The Electroweak Group focuses on the production and decay of W and Z bosons. The mass of the W-boson has been measured and published from Run I data: $m_W = 80.43 \pm 0.11$ GeV/c^2. Results published from Run Ia data include the W and Z production cross sections, and p_T distributions. The production of dibosons ($W\gamma$, $Z\gamma$, WW, WZ) through trilinear couplings, a test of the Standard Model, has been studied with Run I data. D0 is also using vector-boson-plus-jet events as a QCD laboratory: the strong coupling constant α_s has been measured from W+jet events and color coherence effects can be studied here too.

The B-Physics Group has obtained cross sections for low-p_T muons, inclusive b production and J/ψ's. The cross-sections for b and J/ψ production have been measured in previously unexplored large rapidity regions. Measurements of the inclusive b cross-section may also provide a new determination of the strong coupling constant. The b quark fragmentation function has been measured using muons within jets.

The New Phenomena Group is conducting searches for physics beyond the Standard Model. Limits on the production cross-sections for leptoquarks, W', Z' and right-handed W's have been presented. In addition, mass limits and cross-sections have been set for squarks, gluinos and gauginos as predicted by supersymmetric models. In 1998, mass limits were published on possible Dirac monopoles. There were also new limits in excess of 500 GeV on compositeness scales obtained using electron pair data.

The approved D0 upgrade for Run II, E-823, must operate at luminosities near $2\times10^{32}cm^{-2}s^{-1}$ with bunch spacings as short as 132 nanoseconds. To meet the challenges of such a high-rate environment the entire central tracking system will be replaced with a silicon microstrip detector, a scintillating-fiber tracker, a solenoid magnet, and central and forward preshower detectors. The new trackers will provide enhanced pattern recognition and triggering opportunities for both lepton and photon final states. Studies of top quark, electroweak, and b physics will be significantly enhanced by the new detectors.

The scintillating-fiber tracker, an innovative design based upon visible light photon counters, has passed a major developmental milestone with successful operation of a 3000-channel test stand at Fermilab. The single-channel noise rate, quantum efficiency, and photo-electron production all meet or exceed design specifications. The construction of the solenoid magnet is scheduled to be complete in 1997. Improvements in the calorimeter electronics required to meet the high-rate environment have been prototyped in a 3000-channel test. The design of similar improvements for the muon electronics is at an advanced stage. A preliminary design of the upgraded DAQ and triggering system specifies a Level 1 accept rate of 10 kHz, a Level 2 accept rate of 1 kHz and a Level 3 output of 5-10 Hz. The new triggering elements will include the fiber tracking and preshower detectors.

In fall 1998 a proposal was submitted to supplement the components of the Level 2 trigger system with a Silicon Track Trigger. This device would permit the trigger to discriminate on tracks detected in the silicon microstrip detector which do not emanate from the primary vertex. Such tracks are efficient indicators of secondary particle decays, from charm particles but more importantly B hadrons. In turn these signals indicate b quarks in the final state. B quarks are, in turn, characteristic of a number of interesting final states associated with new physics, for example Higgs decays. They also permit triggers on some key calibration channels such as the Z decay to two b jets. The proposal was approved as E-908 in early 1999. Design work is proceeding with a view to installation of this trigger soon after the commissioning of the rest of the E-823 detector.

During 1998 many elements of the upgrade made the transition to the production phase. See also E-900.

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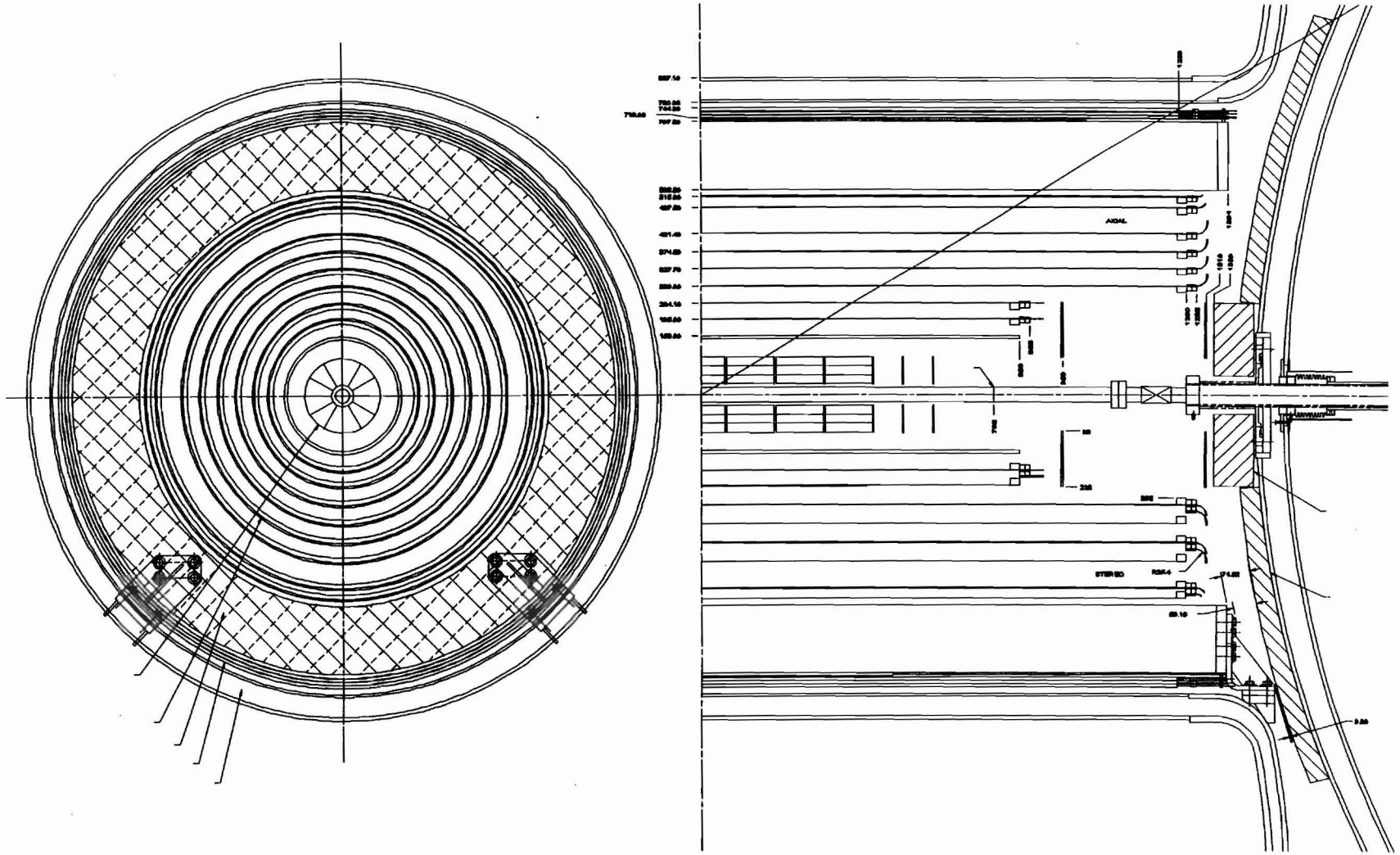
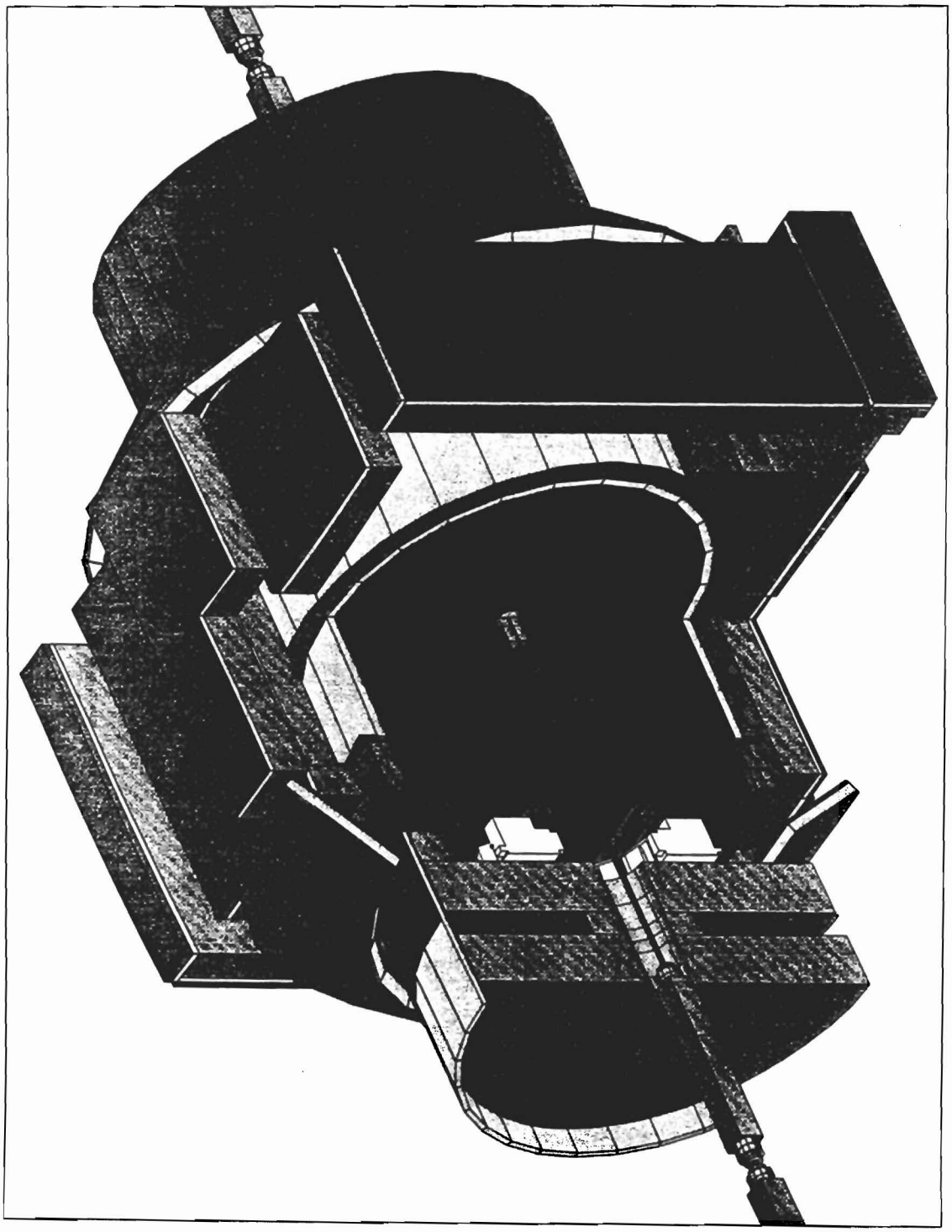


The Run II configuration of the tracking system. Shown are the central silicon vertex tracker, the central scintillating fiber tracker, and the central and forward preshower detectors.


E-830

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

Academia Sinica (Taiwan), ANL, Bologna (Italy), Brandeis, UCLA, Cantabria (Spain), Chicago, Duke, Fermilab, Florida, Frascati (Italy), Glasgow (United Kingdom), Geneva (Switzerland), 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), MIT, Michigan, Michigan State, New Mexico, Ohio State, 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

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. The first-pass event reconstruction for all Run Ia data was completed by the end of 1993, and data analysis is continuing.

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 ≈90 pb^{-1} had been recorded. Data analysis for this Run Ib data is continuing.

The CDF Collaboration has increased dramatically in size since 1989. Thirty-three new institutions have joined, bringing the total to 50 representing 11 countries. A total of more than 475 physicists are now members, up from 187 in 1989.

A total of 182 papers on CDF results have been published and submitted, and 176 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 for 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, 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 a 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 II, 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, Higgs, and other exotic states.

Run II is expected to begin in early 2000.

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. This proposal received Stage I approval by the Fermilab Director in February 1999.

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Search for a Technicolor ω_T Particle in Events with a Photon and a b-quark Jet at CDF, submitted to Phys. Rev. Lett., FERMILAB PUB-98/321-E.

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Search for Third-Generation Leptoquarks from Technicolor Models in $p\bar{p}$ Collisions at $\sqrt{s}$ = 1.8 TeV, submitted to Phys. Rev. Lett., FERMILAB PUB-98/374-E.

Measurement of $b\bar{b}$ Rapidity Correlations in $p\bar{p}$ Collisions at $\sqrt{s}$ = 1.8 TeV, submitted to Phys. Rev. D, FERMILAB PUB-98/392-E.

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Measurement of the Associated $\gamma + \mu^{\pm}$ Production Cross Section in $p\bar{p}$ Collisions at $\sqrt{s}$ = 1.8 TeV, submitted to Phys. Rev. Lett., FERMILAB PUB-99/021-E.

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Theses

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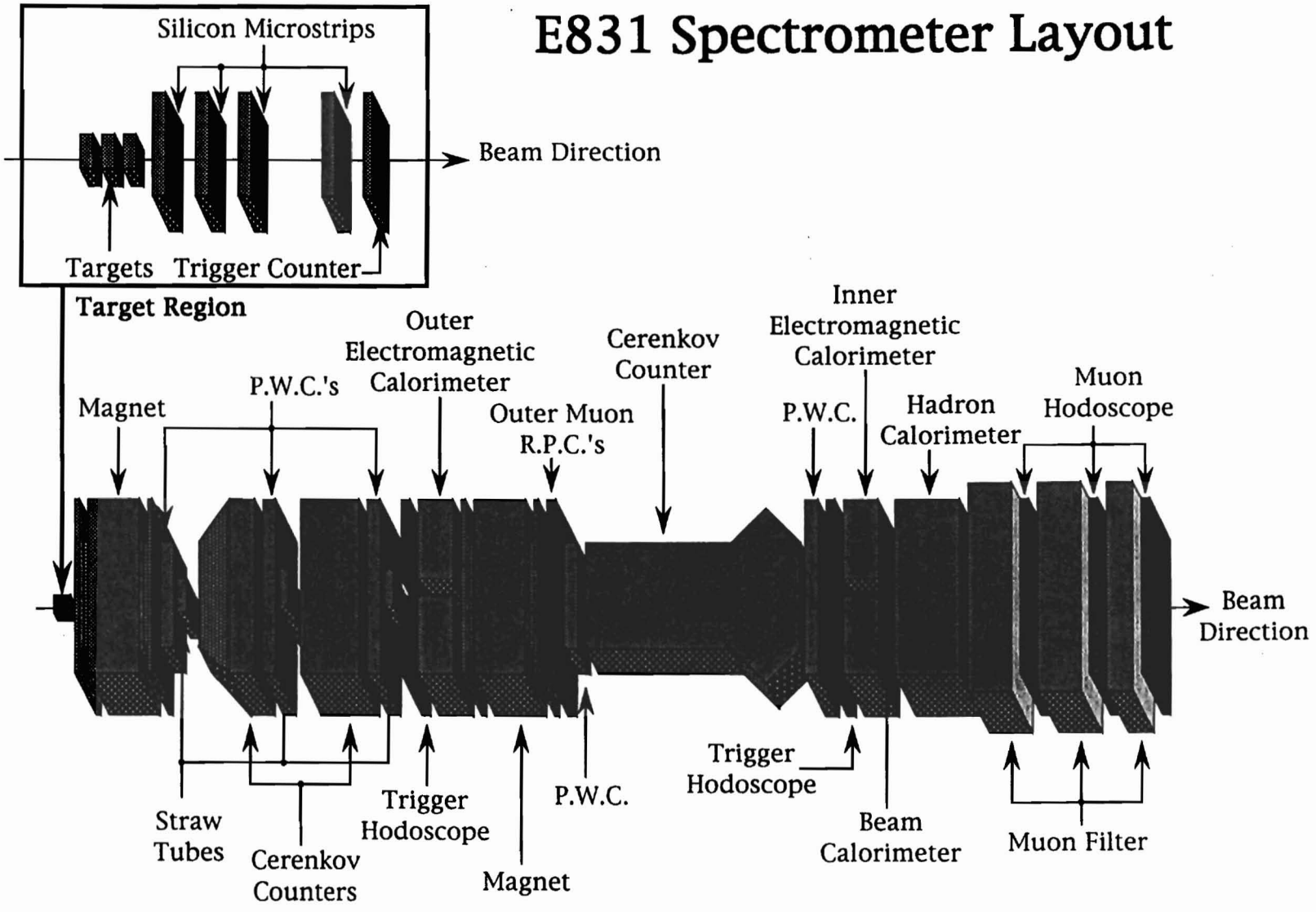
E831 Spectrometer Layout



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 1996-97. We have fully reconstructed in excess of 10^6 charm particles as demonstrated in Figure 1.1. We conservatively estimate that we have more than 10× the yield of E-687 in hadronic decays and more than 40× the yield in semileptonic decays. Our 25 terabytes of data has been processed through off-line event reconstruction and the multistream DST will be complete in February 1999. We anticipate presenting results from the full data sample starting in the summer of 1999.

Several improvements were made in the spectrometer upgrade from E-687. A scintillating fiber calorimeter was fabricated and implemented in the first level trigger to improve efficiency. Both the first and second level triggers were speeded up in order to increase the livetime, and silicon strip detectors were interleaved with the BeO segmented target. New detectors both reduced the electron and muon misidentification as well as improved the electron and muon efficiency.

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.

The mass plots in Figures 1.2-1.5 indicate sensitivity of FOCUS in several crucial areas of investigation. The figures are preliminary and they are not obtained by optimized analyses. As shown, the quality of data is such that we can obtain quasi background-free signals both for mesons and for baryons.

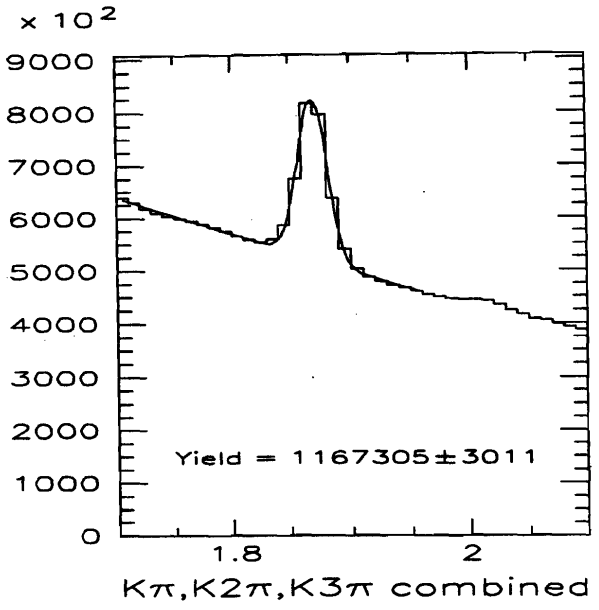


Figure 1.1. Integrated Kππ, Kπ and K3π signal from FOCUS.

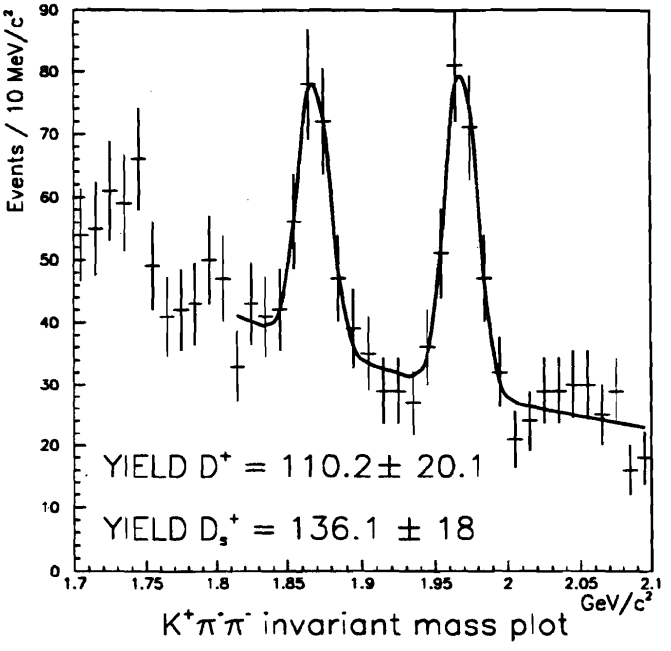


Figure 1.2. Doubly Cabibbo suppressed $D^+ \to K^+\pi^-\pi^-$ and singly Cabibbo suppressed $D_S^+ \to K^+\pi^-\pi^-$ signal yield from 25% of the data sample.

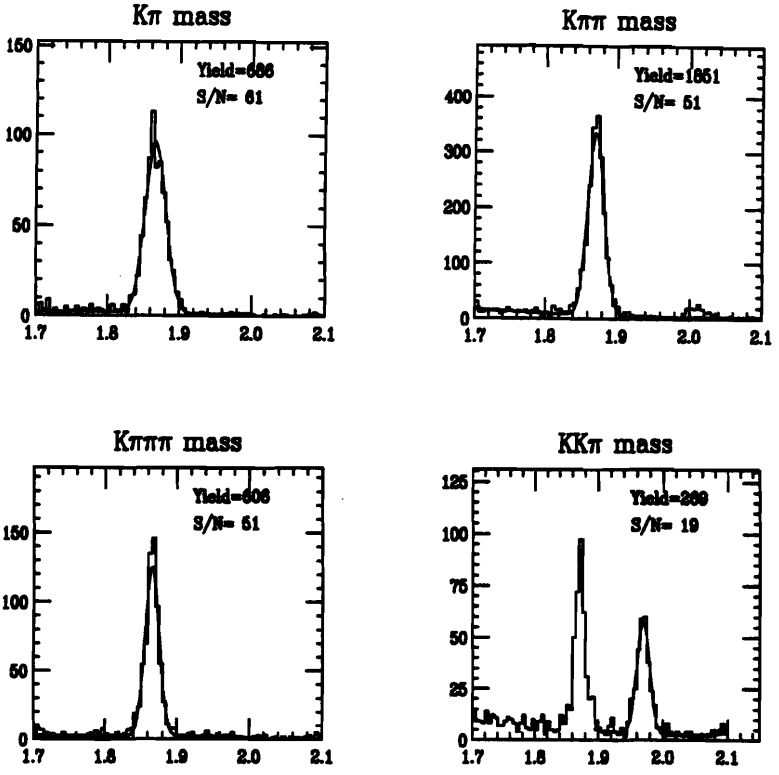


Figure 1.3. Quasi background-free meson signals. $K\pi\pi$, $K\pi$ and $K3\pi$ are from 2% of the data, while $KK\pi$ is from 3% of the data.

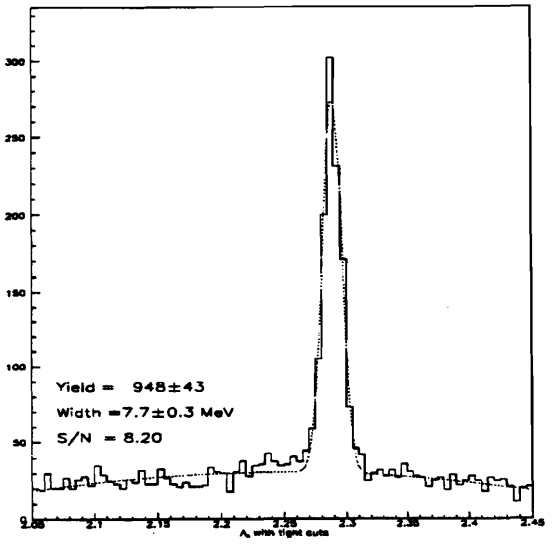


Figure 1.4. Ultra-clean $\Lambda_c^+ \to pK^-\pi^-$ signal based on 26% of the full sample.

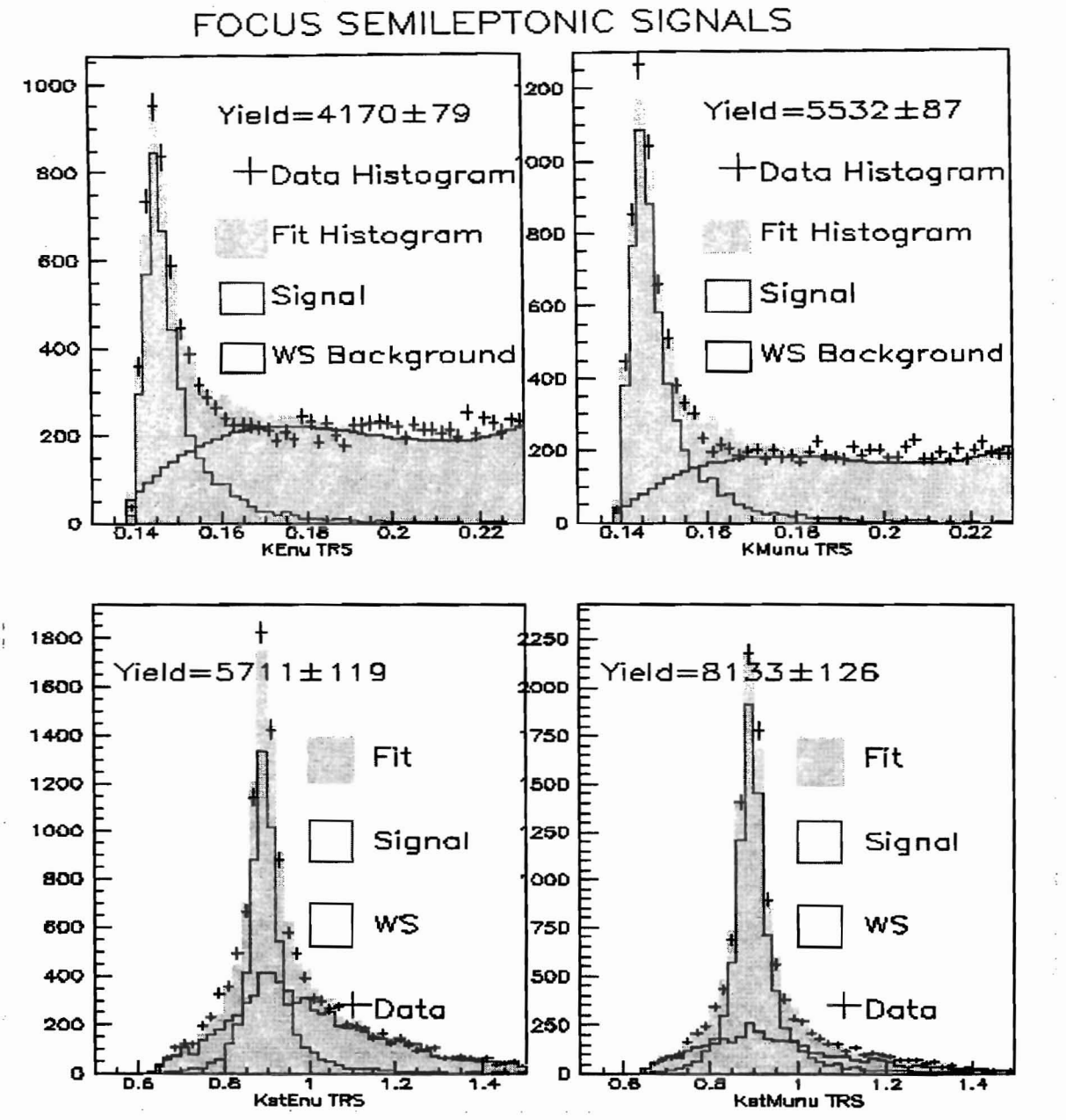
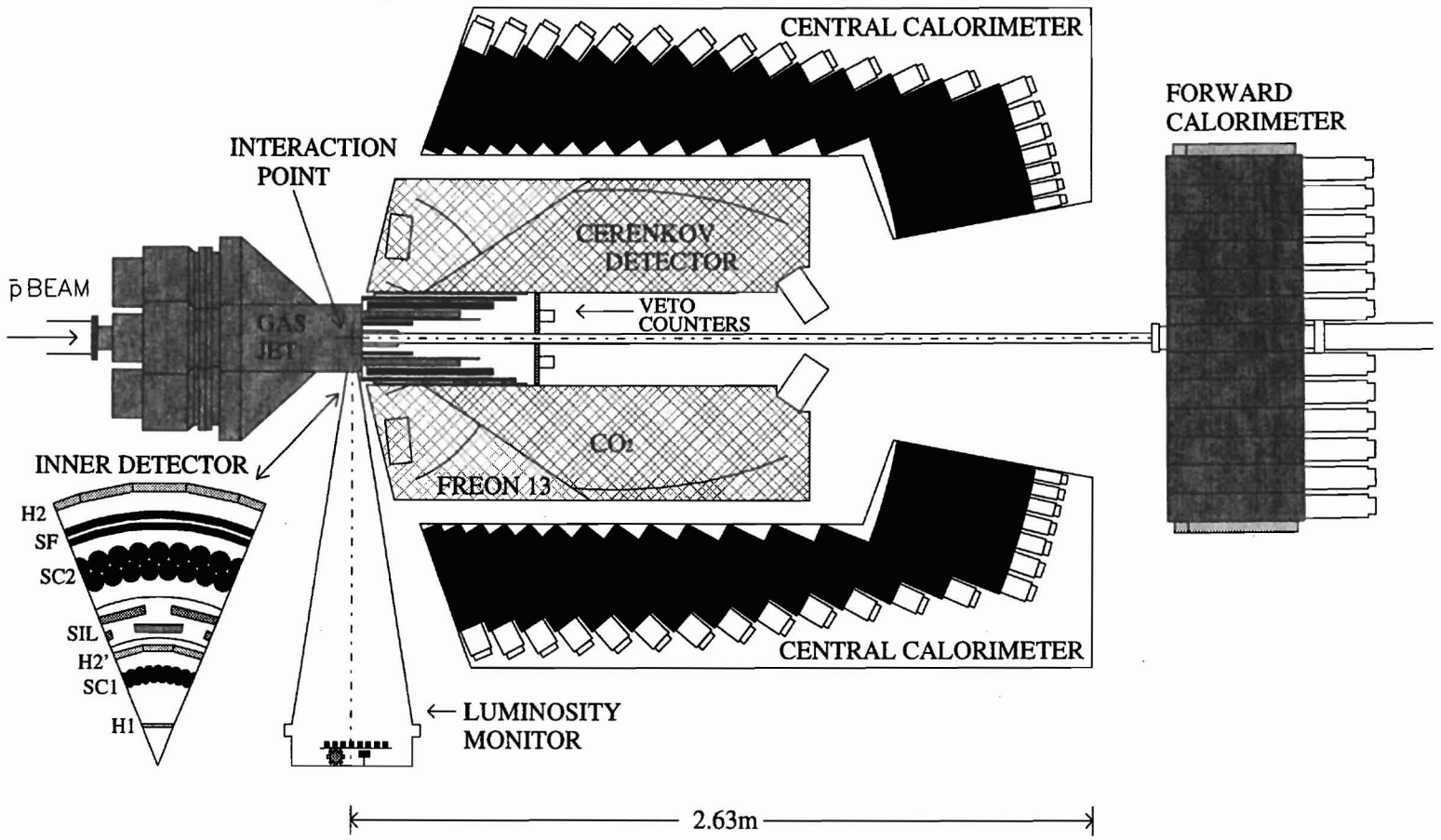


Figure 1.5. $D^0 \to K^- e^+ \nu_e$, $D^0 \to K^- \mu^+ \nu_\mu$, $D^+ \to \bar{K}^{*0} e^+ \nu_e$ and $D^+ \to \bar{K}^{*0} \mu^+ \nu_\mu$ yields based on 23% of the data. Conservatively, a factor of 40 over E-687 is expected for most modes.

E835 EQUIPMENT LAYOUT



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-Taking*

Experiment E-835 is a continuation of the study of charmonium states formed in $\bar{p}p$ annihilation (see www-e835.fnal.gov). The $\bar{p}p$ annihilations are produced in the Fermilab Antiproton Source where the circulating antiproton beam interacts with a hydrogen gas-jet target. The experiment uses a non-magnetic detector with full azimuthal coverage and polar angle coverage from 3 degrees to 65 degrees in the lab frame; the detector is optimized for the identification of electromagnetic final states from charmonium decays. The masses and widths of the decaying states are determined by an excitation curve obtained by varying the $\bar{p}$ beam energy. This technique depends on the measurement of the beam energy and not on the resolution of the final-state detector. The masses of charmonium states can be measured to an accuracy of 0.1 MeV and widths as small as 0.1 MeV can also be determined.

E-835 took ~150 pb^{-1} of data during the 96-97 fixed-target run. The data-taking concentrated on improving the mass and width measurements of the η_c and its $\gamma\gamma$ decay rate, on an attempt to confirm the $^1P_1$ signal reported by E-760 and on a search for the η_c'. The experiment also took data at the J/ψ, χ_1, χ_2 and ψ' states and made a first study of the χ_0.

The attempt to confirm the $^1P_1$ signal was unsuccessful and no obvious signal for the η_c' was observed. Topics of current analysis are:

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

the χ_0 mass and width and $\bar{p}p$ branching ratio;

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

the proton form-factor in the time-like region;

a search for $\phi\phi$ production in $\bar{p}p$ annihilation;

a study of two-body hadronic decays ($\pi^0\pi^0$, $\eta\eta$, $\pi^0\eta$, etc.); and

a study of the angular distribution of electron-positron pairs from J/ψ and ψ' exclusive decays.

The experiment has been approved for another run with the primary goal of reaching a conclusion on the $^1P_1$ signal. Other topics of study, time

permitting, will be the χ_0, the $^3D_2$ and $^1D_2$ states and a refined search for the η_c'. The run is expected to start in late calendar 1999.

Publications

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

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

Theses

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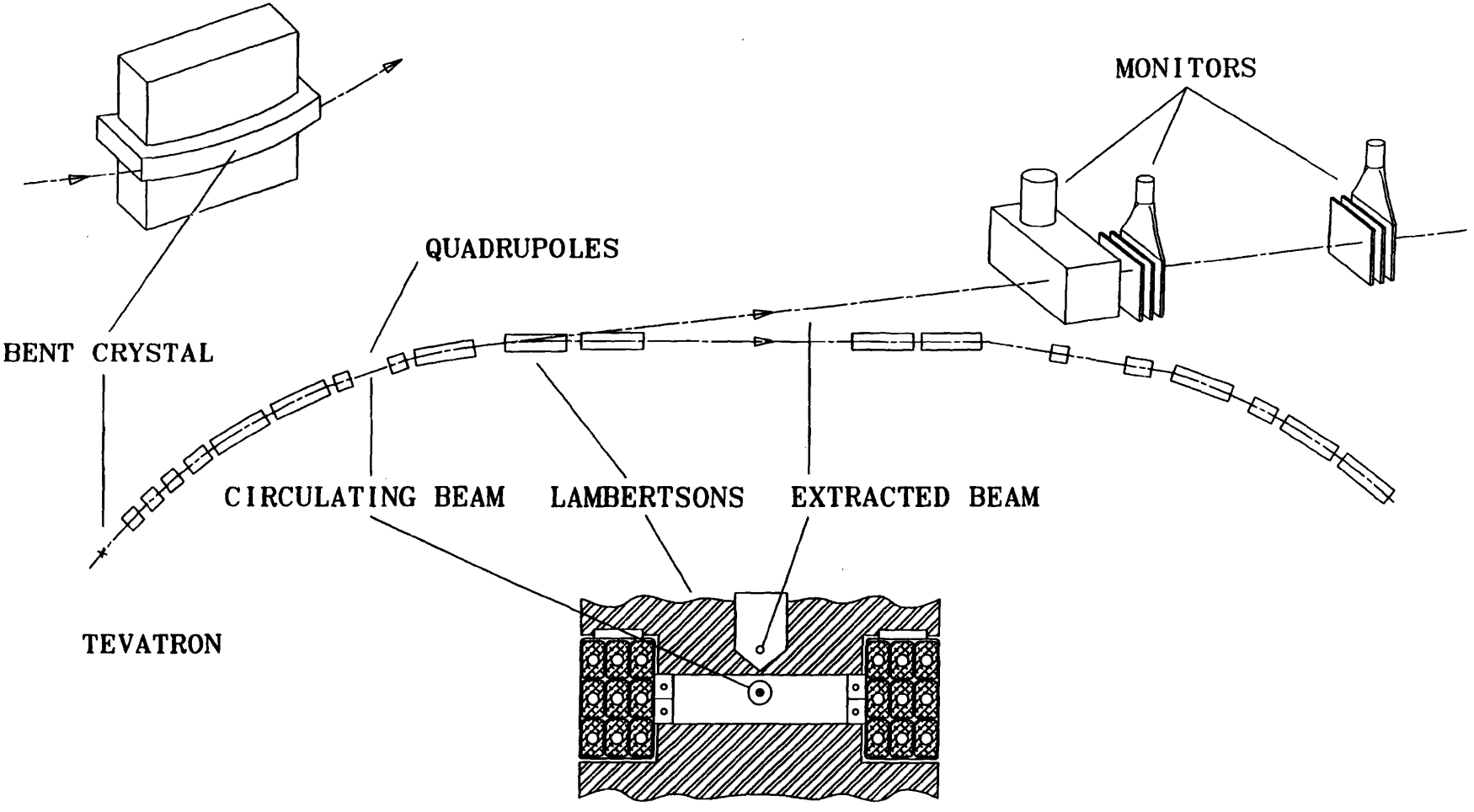
FERMILAB E853
CRYSTAL EXTRACTION
C0 LONG STRAIGHT SECTION



E-853 (Murphy) Test of Low Intensity Extraction from the Tevatron Using Channeling in a Bent Crystal

ANL, UCLA, Fairfield, Fermilab, IHEP/Protvino (Russia), JINR (Russia), New Mexico, PNPI (Russia), Southwestern Med. Center, SUNY/Albany, Texas/Austin, Vanderbilt, Virginia

Status: *Data Analysis*

E-853 is a study of the feasibility and efficiency of extracting a beam from the halo of the Tevatron using channeling in a bent silicon crystal. It has also tested the effectiveness of bent crystals as halo scrapers for collider experiments. The motivation of the experiment was to apply crystal extraction to TeV-range accelerators. The data-taking phase of the experiment has been completed. The experiment was a distinct success, demonstrating that a robust beam could be extracted parasitically with no consequential impact on the collider experiments.

Characteristically, E-853 removed 10^{-7} of the circulating protons in the accelerator each second (about 10^5 protons/sec). The luminosity lifetime was approximately 18 hours during the run. The above extraction rate corresponds to a much longer proton beam intensity lifetime so that the luminosity lifetime during these extraction experiments was almost unchanged.

The Tevatron was a good test bed for studies of crystal extraction since it is superconducting, a collider, operates at high energy, and had collider experiments in operation. These features offered a distinct advantage over a related crystal extraction experiment at CERN (RD22).

E-853 was carried out in the 1995-96 time period in the C0 straight section, the normal location of the proton abort line. During collider runs, the abort line is not used at 900 GeV, so one kicker magnet was replaced by a bent crystal (see the figure). The crystal was positioned to the outside of the beam with an upward curvature of 640 μrad to deflect beam halo into the field-free region of the Lambertson magnets. The crystal was mounted in the B48 straight section at the upstream end of a 1-m beam pipe with articulating bellows which served as a precision goniometer. Scintillators in the extraction line monitored the extracted beam. A CCD camera imaging a fluorescent flag was also mounted in the line. Since the C0 abort line was used for disposing of 150 GeV protons during Tevatron injection, the detectors in the line retracted when the Tevatron was not in a 900 GeV store. There were also monitors at the crystal location to measure the interaction rate of the circulating protons with the crystal.

During this run we demonstrated extraction of 900 GeV protons (obviously the highest energy at which channeling has been observed). The channeling extraction efficiency was studied in different situations with

several techniques. Beam was extracted in a few turns (kick mode) and with natural, noise-driven, and luminosity-driven diffusion (diffusion mode). Multiple crystal pass effects were observed and found to be significant. The technique has proved to be robust and crystal alignment was reproducible. It should be emphasized that significant beam intensities were extracted. On the order of 0.1 MHz can be extracted without violating CDF or D0 loss limits. Several interesting accelerator phenomena have been illuminated in the course of these studies. Two simulation models are in use to model channeling and accelerator effects.

We are now in the process of analyzing these studies to refine the efficiency measurements, investigate luminosity-driven diffusion, and follow some of the interesting accelerator phenomena. We believe the current system could be used as an active scraper in the Tevatron to diminish distributed radioactivity, and as a bunch eliminator when coupled with the E17 kicker. The technique could also be used to extract a parasitic 0.1 MHz beam to the 900 GeV areas during Collider operation.

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R. Carrigan et al., Proc. Workshop on B Physics at Hadron Colliders, Snowmass, p. 645 (1993).

R. Carrigan et al., Nucl. Instr. and Meth. B90, 128 (1994).

G. Jackson et al., Proc. 1995 Part. Acc. Conf.

V. Biryukov, Simulation of an Experiment on Crystal Extraction of 900 GeV Protons, Phys. Rev. E52, 6818 (1995).

C. T. Murphy et al., First Results from Bent Crystal Extraction at the Fermilab Tevatron, Proc. Relativistic Channeling Workshop, Aarhus (1995), Nucl. Instr. and Meth. B119, 231 (1996).

S. A. Bogacz, et al., Simulation Results of Bent Crystal Extraction in the Tevatron, Nucl. Instr. and Meth. B119, 244 (1996).

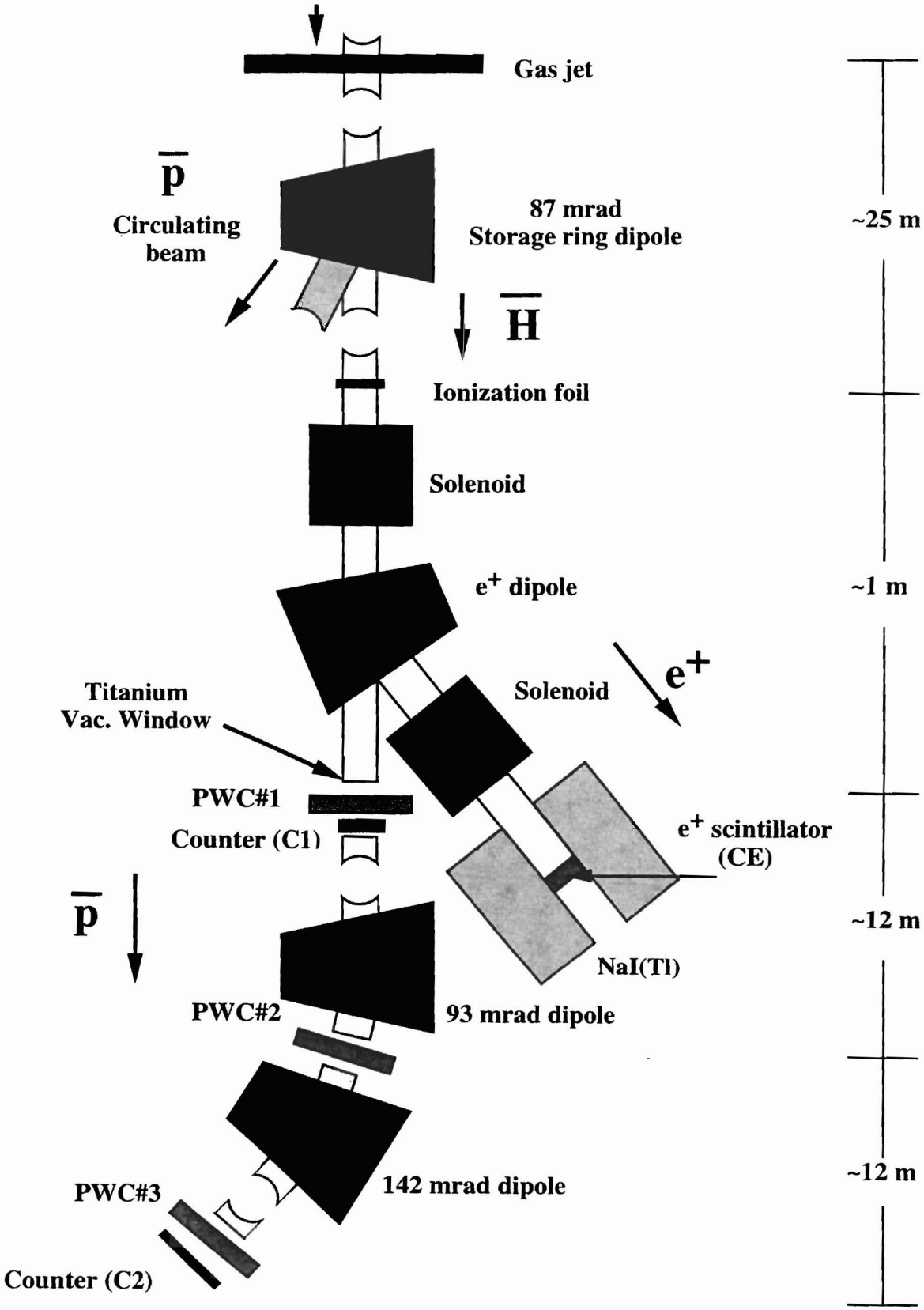
See also CERN Courier, Jan/Feb 96; AIP Weekly Physics News, March 6, 1996.

C. T. Murphy and R. A. Carrigan, Results from Bent Crystal Extraction at the Fermilab Tevatron, Proc. International Symposium on Near Beam Physics, Fermilab, 157 (1998).

R. Carrigan et al., First Observation of Luminosity-Driven Extraction Using Channeling with a Bent Crystal, Phys. Rev. ST Accel. Beams 1, 022801 (1998).

C. T. Murphy, Crystal Extraction of Beam from High-Energy Hadron Accelerators, Proc. HEACC'98 Conf. (to be published 1999).

E-862


Gas jet
$\bar{p}$
Circulating beam
87 mrad Storage ring dipole
$\bar{H}$
Ionization foil
Solenoid
e^+ dipole
Titanium Vac. Window
Solenoid
e^+
PWC#1
Counter (C1)
e^+ scintillator (CE)
$\bar{p}$
NaI(Tl)
PWC#2
93 mrad dipole
142 mrad dipole
PWC#3
Counter (C2)
~25 m
~1 m
~12 m
~12 m

E-862 (Christian) Search for Antihydrogen in the Reaction $\bar{p}p \rightarrow \bar{H}pe^-$

UC/Irvine, Fermilab

Status: *Data Analysis*

The goal of this experiment was the detection of a sample of antihydrogen atoms – the bound state ($\bar{p}e^+$). This is the first element ever constructed entirely out of antimatter. A source of antihydrogen atoms is needed to compare antihydrogen with hydrogen spectroscopy, to search for interactions that violate CPT.

E-862 was run parasitically on experiment E-835 in the Antiproton Accumulator. Atoms of antihydrogen were formed in the reaction $\bar{p}p \rightarrow \bar{H}e^-p$ when a positron, created as a member of an e^+e^- pair by a beam $\bar{p}$ in the Coloumb field of a target p, was captured by the beam $\bar{p}$. This process involves momentum transfer of order m_ec, so the $\bar{H}$ atoms were produced with $\gtrsim 99.95\%$ of the beam momentum, and did not separate from the $\bar{p}$ beam until the beam was deflected 87 mrad by the storage ring dipole magnet 18 meters downstream of the gas jet target. The vacuum pipe through this magnet was modified to allow the neutral $\bar{H}$ to exit the storage ring. Six meters downstream, the atom was ionized in a thin carbon foil that was mounted on a wheel so that it could be removed from the beamline by remote control. The component e^+ and $\bar{p}$ each retained the velocity of the atom (although the e^+ direction was changed somewhat by multiple scattering in the foil); the momentum was shared in the ratio of the masses (0.511/938). The e^+ and $\bar{p}$ were detected in separate spectrometers. The positron was deflected through an angle of 40° by a small sector dipole, and stopped in a 2.54 cm thick scintillation counter (CE) that was exposed to the Accumulator machine vacuum. Two solenoid magnets provided a point-to-point focus between the ionization foil and counter CE. The counter was surrounded by a cylindrical NaI(Tl) counter composed of two half-cylindrical crystals, each of which was instrumented with three photomultiplier tubes. The purpose of the NaI(Tl) counter was to detect the 511 keV γ rays produced when the positron annihilated with an electron in the CE counter.

The $\bar{p}$ momentum was measured in a 24.4 m long spectrometer. The two dipole magnets in this spectrometer were energized in series with the Accumulator dipole magnets, so that a beam-momentum particle was deflected by 235 milliradians, independent of the value of the beam momentum. Position measurements were provided by three proportional wire chambers with 1 mm wire spacing. This spectrometer provided a measurement of track momentum relative to the nominal beam momentum, and covered the range $0.95<p/p_{beam}<1.05$. Two scintillation counters, a 1.6 mm thick counter (C1) located just downstream of PWC#1, and a 3.2 mm thick counter (C2) located two meters downstream of PWC#3, completed the $\bar{p}$ spectrometer. C1 and C2 were each instrumented with two photomultiplier tubes. Pulse height and leading edge timing information was recorded for

each tube, and a coincidence signal of the two tubes on each counter was formed for use in triggers.

During 1996, the E-862 apparatus was installed and the experiment started data-taking. The first antihydrogen event was recorded on November 10, and by the end of the year E-862 had collected more than a dozen clean antihydrogen events with no background. Antihydrogen could be separated from all backgrounds simply by requiring that events contain a three-way coincidence of CE, C1, and C2, and that either PWC#2 or PWC#3 register at least one wire hit. All events thus selected were found to contain a beam momentum antiproton track and data consistent with a positron of the expected momentum.

Data-taking continued until September 18, 1997. During 1997 the collaboration concentrated on

1. demonstrating that the signal could *only* be due to antihydrogen by showing that it depended on the presence of the thin ionization foil; and

2. determining the geometrical acceptance of the apparatus, by increasing all limiting apertures.

In data collected with the ionization foil out of the beamline, no three-way coincidence of CE, C1, and C2 was recorded. However, in this configuration, a new antihydrogen signature was discovered. Since, in these events, the ionization occurred downstream of the small e^+ dipole magnet, the e^+ was not directed to the CE counter, but rather passed through PWC#1 along with the $\bar{p}$. Multiple scattering of the e^+ in the titanium window caused the e^+ to separate from the $\bar{p}$, resulting in two hits registered by the PWC. The upper histogram in Figure 1 shows the momentum spectrum of all tracks found in the foil-in data sample. Entries corresponding to events with a three-way coincidence of C1, C2, and CE are shaded. The lower histogram shows the corresponding momentum spectrum from data collected with the ionization foil out of the beamline. Entries from events containing a spectator hit in PWC#1 are shaded.

The analysis of E-862 was completed in November 1997, and a paper was published in Physical Review Letters. The results are summarized in Table 1. The relatively small systematic error in these results was made possible by the high quality luminosity measurement provided by E-835 and by the fact that the acceptance and efficiency of the E-862 apparatus were both high.

The $\bar{H}$ production cross section measured by E-862 is close to a factor of four smaller than the cross section that had been computed before the experiment ran. However, a recent calculation by Bertulani and Baur gives a cross section of 0.91pb at p_{beam} = 5700 MeV/c, which is consistent with our measurement.

Table 1. $\bar{H}$ production cross section, for three data sets taken with 5203 MeV/c $\leq p_{beam} \leq$ 6232 MeV/c, and for the combined data set.

	437 μgm/c m^2 Foil	777 μgm/c m^2 Foil	Foil Out	Full Data Set
Luminosity (pb^{-1})	34.8	29.6	10.4	74.8
Acceptance × Efficiency	0.67	0.92	0.80	0.79
Sensitivity (pb^{-1})	23.3	27.2	8.3	58.8
Number of Events	24	33	9	66
Background	0	0	0.16	0.16
Cross Section (pb)	1.03	1.22	1.07	1.12
Statistical Error (pb)	0.21	0.21	0.36	0.14
Systematic Error (pb)	0.08	0.09	0.14	0.09

Publications

Observation of Atomic Antihydrogen, Phys. Rev. Lett. 80, 3037 (1998).

Measuring the Antihydrogen Lamb Shift with a Relativistic Antihydrogen Beam, Phys. Rev. D57, 6649 (1998).

Thesis

G. Blanford, University of California/Irvine, 1997.

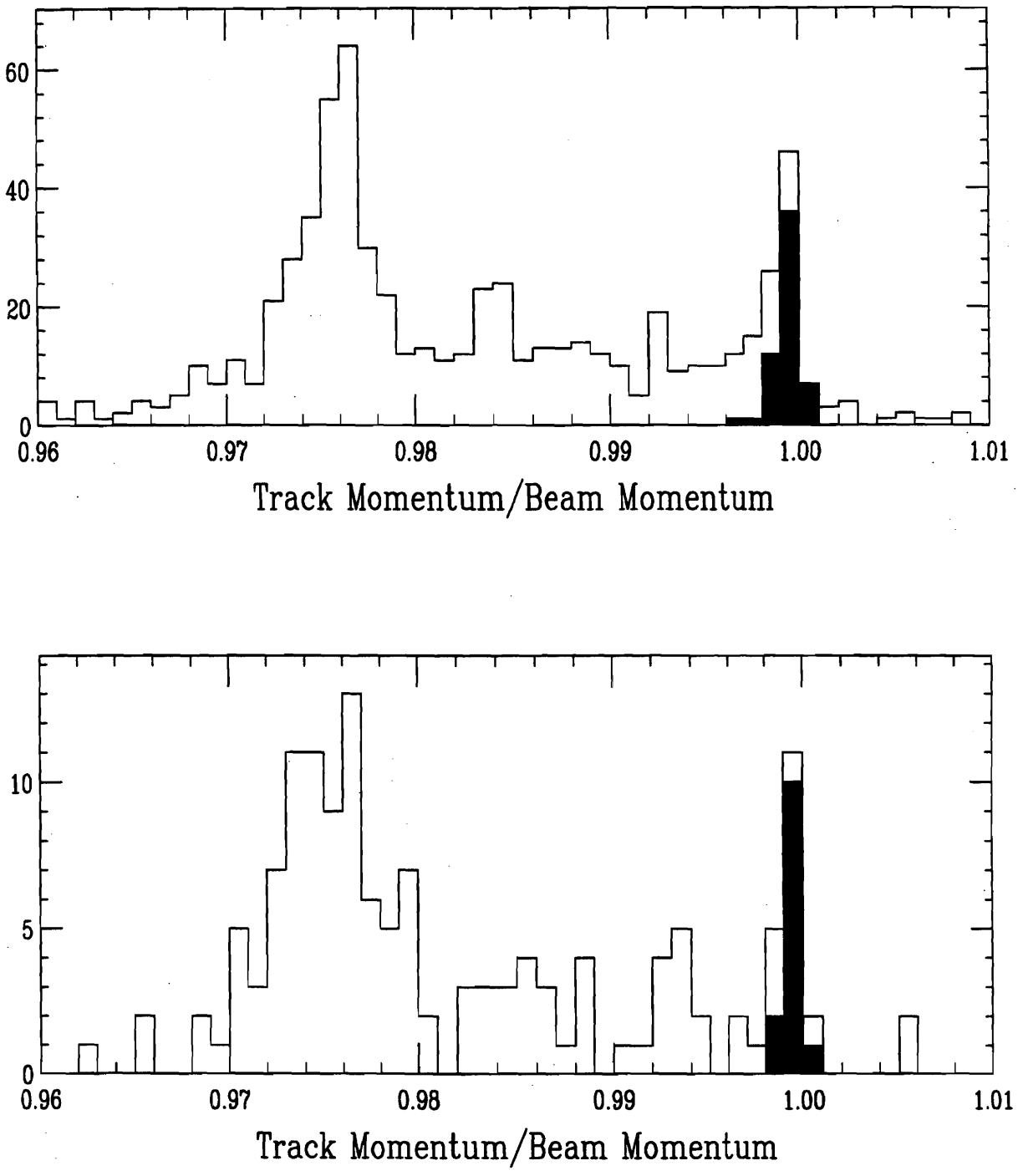
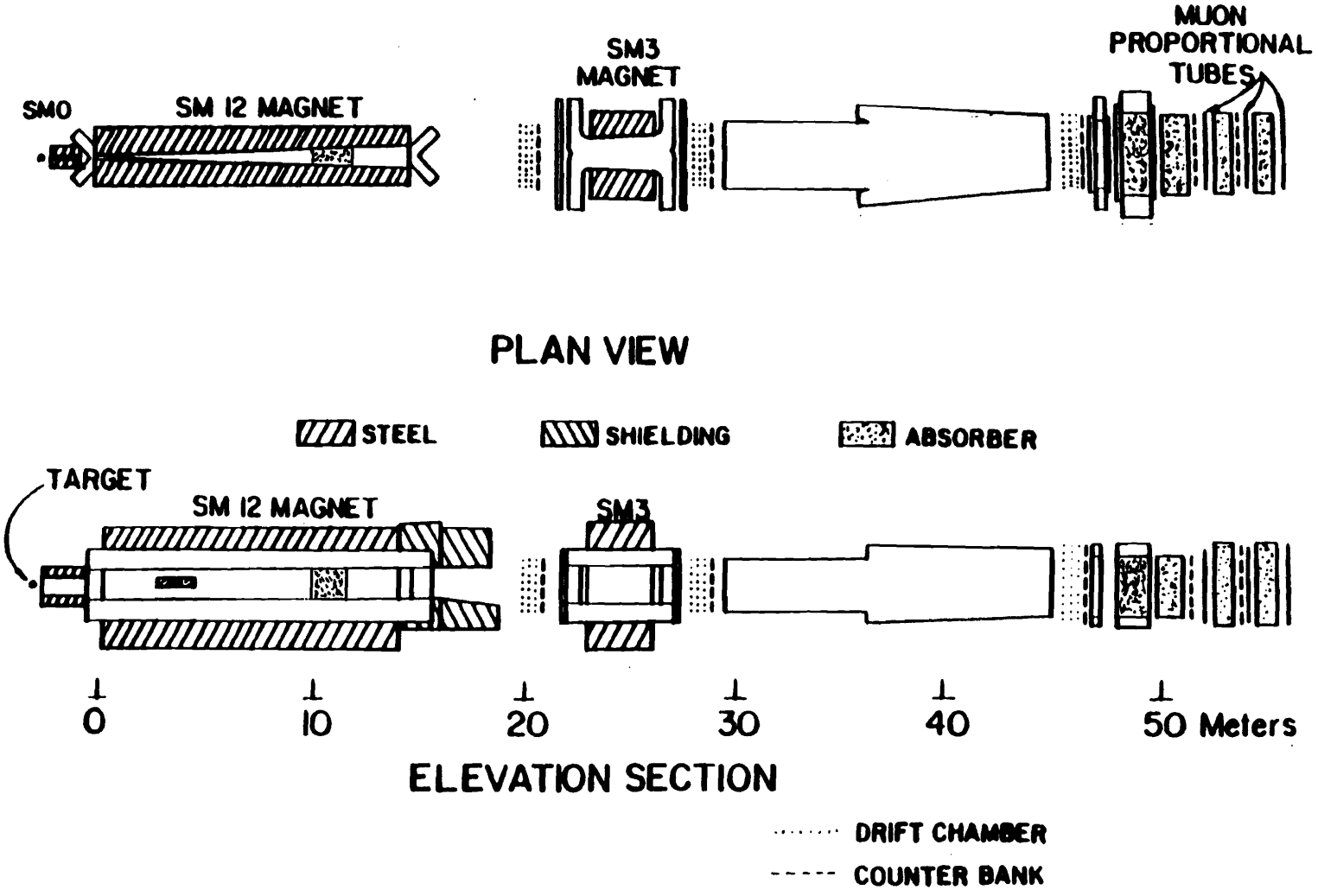


Figure 1. The upper histogram shows the momentum spectrum of all tracks found in the foil-in data sample. Entries corresponding to events with a three-way coincidence of C1, C2, and CE are shaded. The lower histogram shows the corresponding momentum spectrum from data collected with the ionization foil out of the beamline. Entries from events containing a spectator hit in PWC#1 are shaded.

E-866


SM0
SM 12 MAGNET
SM3
MAGNET
MUON
PROPORTIONAL
TUBES
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) Measurement 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 J/ψ nuclear dependence over a very broad range 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 vector-meson production. Analysis of this data is well underway with preliminary results having been presented at a number of conferences, and two papers, including a Phys. Rev. Lett., already published.

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 parameterizations of the sea. For $x > 0.2$, the observed $\bar{d}/\bar{u}$ ratio is much nearer unity than given by the parameterizations. Newer parameterizations agree well with our data since they now include it in their fits.

Preliminary results for the nuclear dependence of vector-meson production are also beginning to come out of our analysis, These show dramatic variations in the suppression of vector-mesons versus x_F and p_T. These are very interesting in terms of understanding the underlying mechanisms and also towards being able to interpret future data from heavy-ion collisions at RHIC.

One of the six graduate students who are working towards Ph.D.'s on various physics topics using data from E-866 is now finished and has also received the DNP thesis award for 1999. Three others plan to finish by mid- to late-1999.

Publications

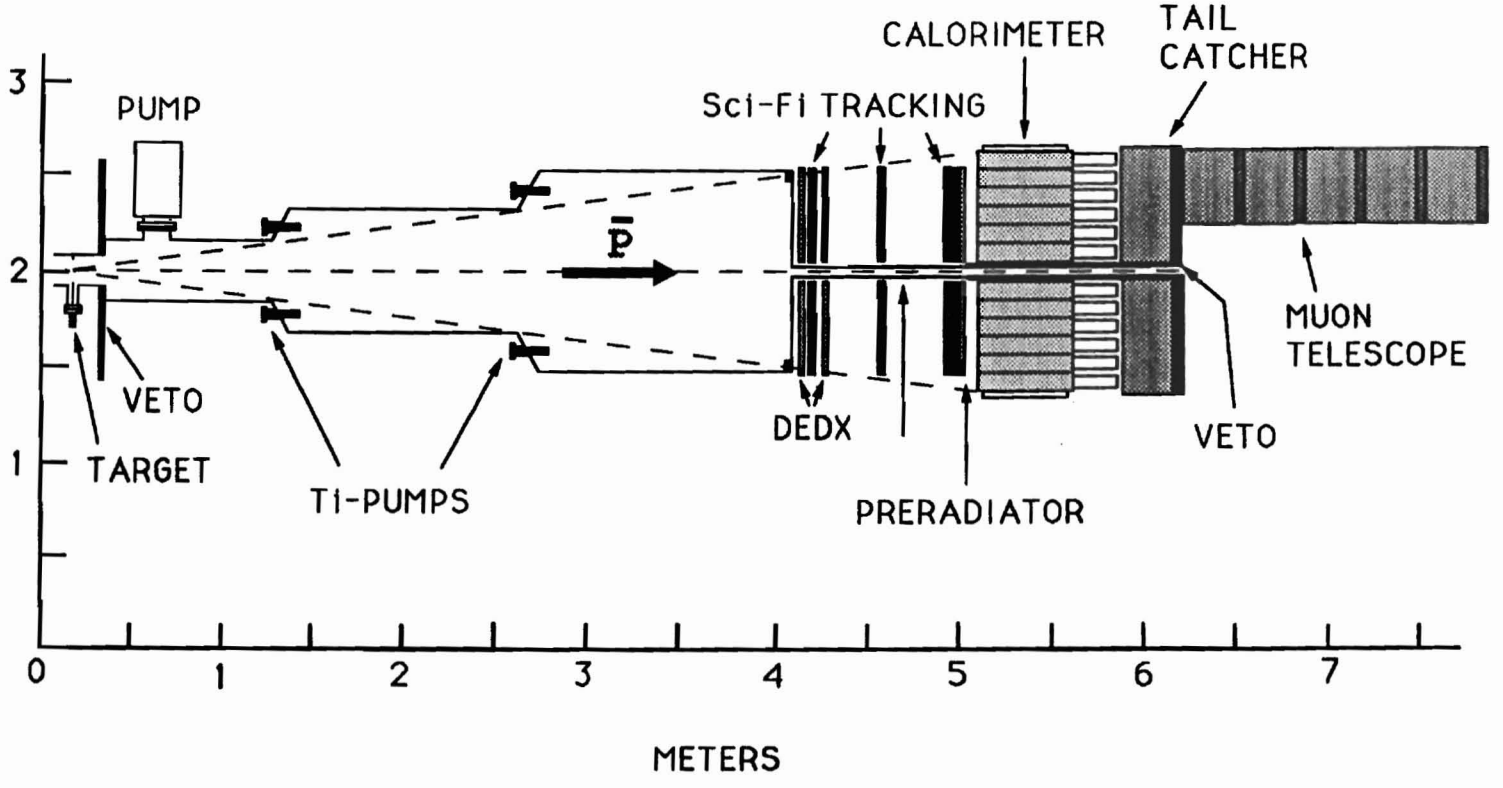
$\bar{d}/\bar{u}$ Asymmetry and the Origin of the Nucleon Sea, J. C. Peng et al., Phys. Rev. D58, 92004 (1998).

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. Inst. and Meth. A418, 322 (1998).

Thesis

E. Hawker, Texas A&M University, 1998.


CALORIMETER
TAIL CATCHER
PUMP
Sci-Fi TRACKING
$\bar{p}$
MUON TELESCOPE
VETO
DEDX
VETO
TARGET
Ti-PUMPS
PRERADIATOR
3
2
1
0
1
2
3
4
5
6
7
METERS

E-868 (Geer) Search for Antiproton Decay at the Fermilab Antiproton Accumulator

UCLA, Fermilab, Michigan, Nebraska, Penn State

Status: *Data Analysis*

E-868 (APEX) is an experiment designed to search for antiproton decay at the Fermilab Antiproton Accumulator operating at 8.9 GeV. The CPT theorem requires that the antiproton lifetime $\tau_{\bar{p}}$ equals the proton lifetime which we know exceeds 10^{32} years. In practice we can only hope to observe antiproton decay if $\tau_{\bar{p}} << 10^{32}$ years. APEX is therefore a test of the CPT theorem and of the intrinsic stability of antimatter.

Our present experimental knowledge of the stability of the antiproton is modest. Prior to the recent T-861 test experiment, which was designed to prepare the way for APEX, the best limit on $\tau_{\bar{p}}$ came from observing ~1000 antiprotons in an ion trap for two months, which yielded $\tau_{\bar{p}} > 3$ months. The T-861 experiment at the Fermilab Antiproton Accumulator searched for explicit two-body decay modes of the antiproton containing an electron in the final state (angular momentum conservation requires that there is a final state fermion; electron, muon, or neutrino). T-861 obtained limits on several antiproton decay modes, the most stringent being $\tau_{\bar{p}}$/ BR($\bar{p} \rightarrow e^{-}\gamma$) > 1848 years at the 95% confidence level. [S. Geer et al., PRL 72, 1596 (1994)].

The APEX experiment was designed to achieve a sensitivity $\tau_{\bar{p}}$/ BR = $O(10^5\text{-}10^6)$ years for several decay modes. The experiment was installed in the AP50 region of the Antiproton Accumulator, and took data in the period April-July 1995, during times when there were $O(10^{12})$ antiprotons stored and stacking was not taking place. The experiment consisted of a 3.5-meter-long decay tank, downstream of which were (i) three horizontal and three vertical scintillating-fiber tracking planes to allow reconstruction of charged tracks; (ii) dE/dx counters to distinguish between single electrons and conversion pairs, and to provide a trigger; (iii) a lead-scintillator preradiator to assist electron identification; (iv) a lead-scintillator electromagnetic calorimeter to locate electrons and photons and measure their energies; (v) a lead-scintillator tail catcher behind the calorimeter to aid electron and photon identification; and (vi) a limited-acceptance muon telescope to explore the possibility of searching for decay modes with a muon in the final state. The detector is described in T. Armstrong et al., Nucl. Instr. and Meth. A411, 210 (1998).

The experiment recorded a data sample which corresponds to a single-event sensitivity of $3 \times 10^9 \times \varepsilon$ years, where ε is the fraction of antiprotons decaying uniformly around the ring that would trigger the experiment. We have seen no evidence for the first antiproton decay, and have published limits on six decay modes with a muon in the final state:

$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}\gamma) > 5.0 \times 10^{4}$ yr,
$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}\pi^{0}) > 4.8 \times 10^{4}$ yr,
$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}\eta) > 7.9 \times 10^{3}$ yr,
$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}\gamma\gamma) > 2.3 \times 10^{4}$ yr,
$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}K_{S}^{0}) > 4.3 \times 10^{3}$ yr,
$\tau_{\bar{p}}/\,B\,(\bar{p} \rightarrow \mu^{-}K_{L}^{0}) > 6.5 \times 10^{3}$ yr.

In addition, preliminary results from searches for $\bar{p} \rightarrow e^{-}\gamma$ and $\bar{p} \rightarrow e^{-}\pi^{0}$ have yielded lower limits on τ/B of a few $\times 10^{5}$ yr.

Publications

A Detector to Search for Antiproton Decay at the Fermilab Antiproton Accumulator, T. Armstrong et al., Nucl. Inst. and Meth. A411, 210 (1998).

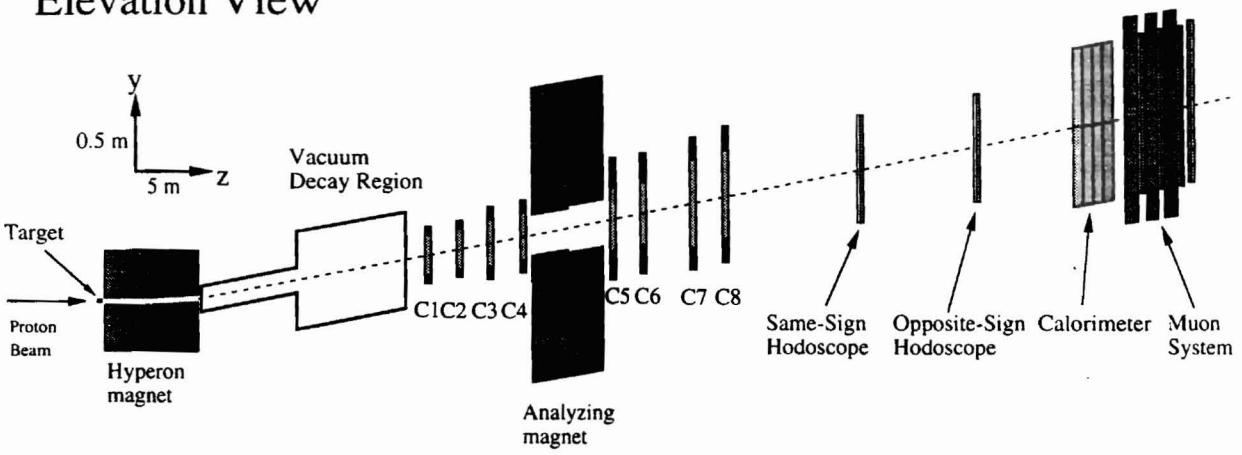
Search for Muonic Decays of the Antiproton at the Fermilab Antiproton Accumulator, M. Hu et al., Phys. Rev. D58, 111101 (1998).

Thesis

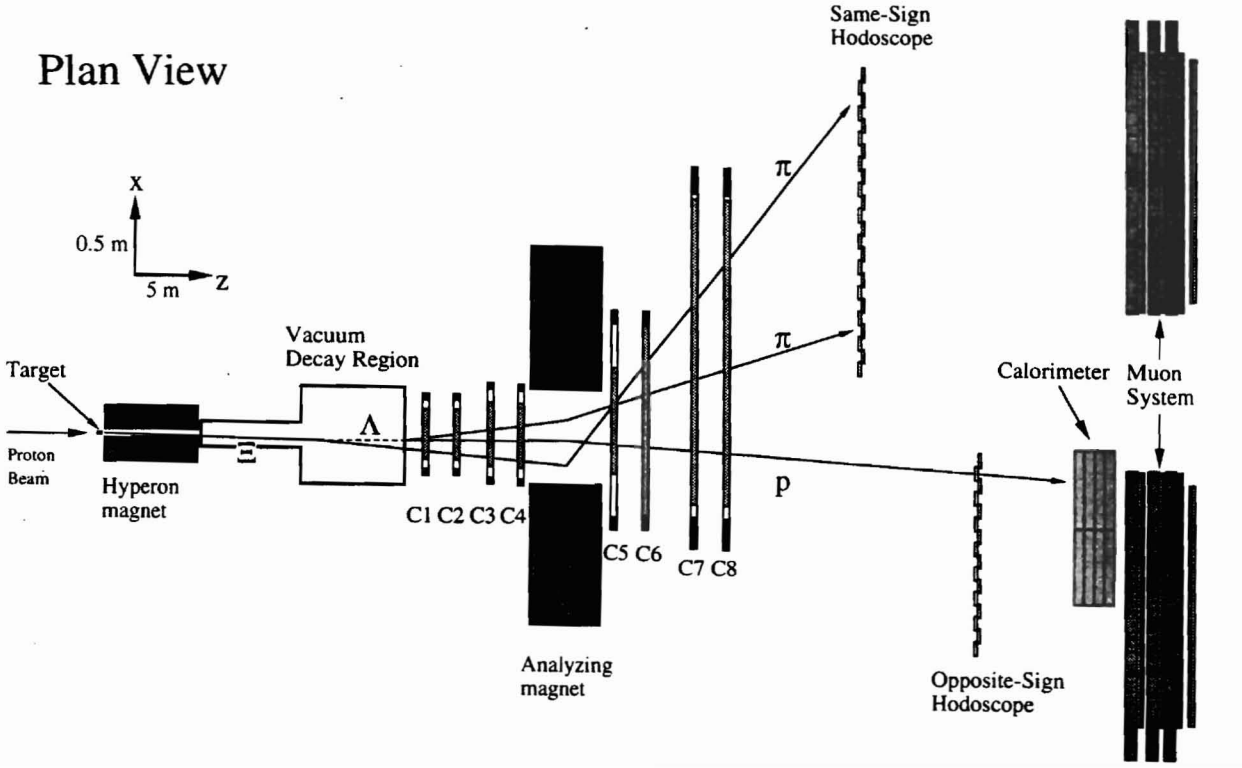
B. Corbin, UCLA, 1998.
M. Hu, University of Nebraska, 1998.

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-Taking*

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 and whether direct CP violation exists — as predicted by the Standard Model — remain outstanding experimental questions.

Both of these important issues are 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 $|\Delta S|=1$.

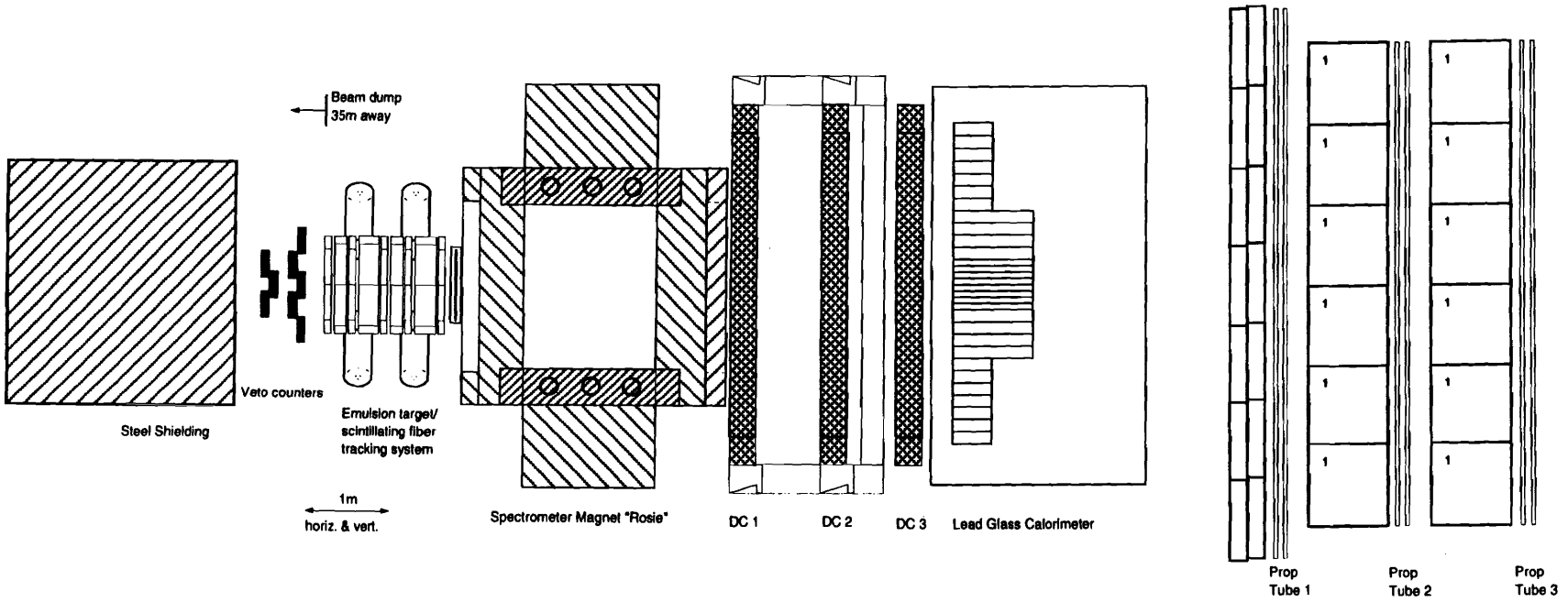
The design of the E-871 spectrometer is based on twenty years of experience in doing hyperon physics at Fermilab. The apparatus is simple and has a much higher rate capability than previous hyperon experiments. A target followed by a curved collimator embedded in a dipole (hyperon) magnet produces a 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 expect to reconstruct 1.6 billion $\Xi \rightarrow \Lambda\pi$ decays and 280 million $K^{\pm} \rightarrow 3\pi$ decays, as well as a large number of $\Omega \rightarrow \Lambda K$ decays. This would yield a statistical sensitivity of about 2×10^{-4} in the search for CP violation in the Ξ-Λ decays.

Since the end of the run we have concentrated our efforts on: 1) careful studies of the track reconstruction codes; 2) improving the event yield; 3) bringing up the farm code; and 4) making preliminary physics studies. Farm analysis is well underway and is expected to be finished in the spring of 1999.

The experiment has been approved to run in the 1999 fixed-target period. Modest upgrades to the experimental apparatus will result in better quality data, and an improvement in the speed of the data acquisition system should result in a factor of four increase in statistics over a six-month run. The statistical error in the CP-violating alpha parameter difference should be about 1×10^{-4}. Systematic errors are expected to be smaller.

E-872 Spectrometer Plan View



E-872 (Paolone) Measurement of τ Production from the Process $\nu_\tau + N \rightarrow \tau$

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*

The direct observation of the tau neutrino through its charged-current interaction, in the manner of the ν_e and ν_μ discoveries, waits to be made. Since 1975 the desire to detect the ν_τ has been strong, but the proposed experiments were technically challenging, required large resources and relied on poorly known charm production cross-sections. In retrospect, using what we know now, it is clear that these efforts were not optimized to see ν_τ interactions. Today, the ν_τ production uncertainties are small, and using ultra-high resolution emulsions coupled with the technology of 1994 we can be confident in E-872 of measuring such an experimentally demanding process. There is compelling experimental evidence that a third neutrino exists, but since the ν_τ is the focus of many theoretical and experimental studies its direct confirmation is due.

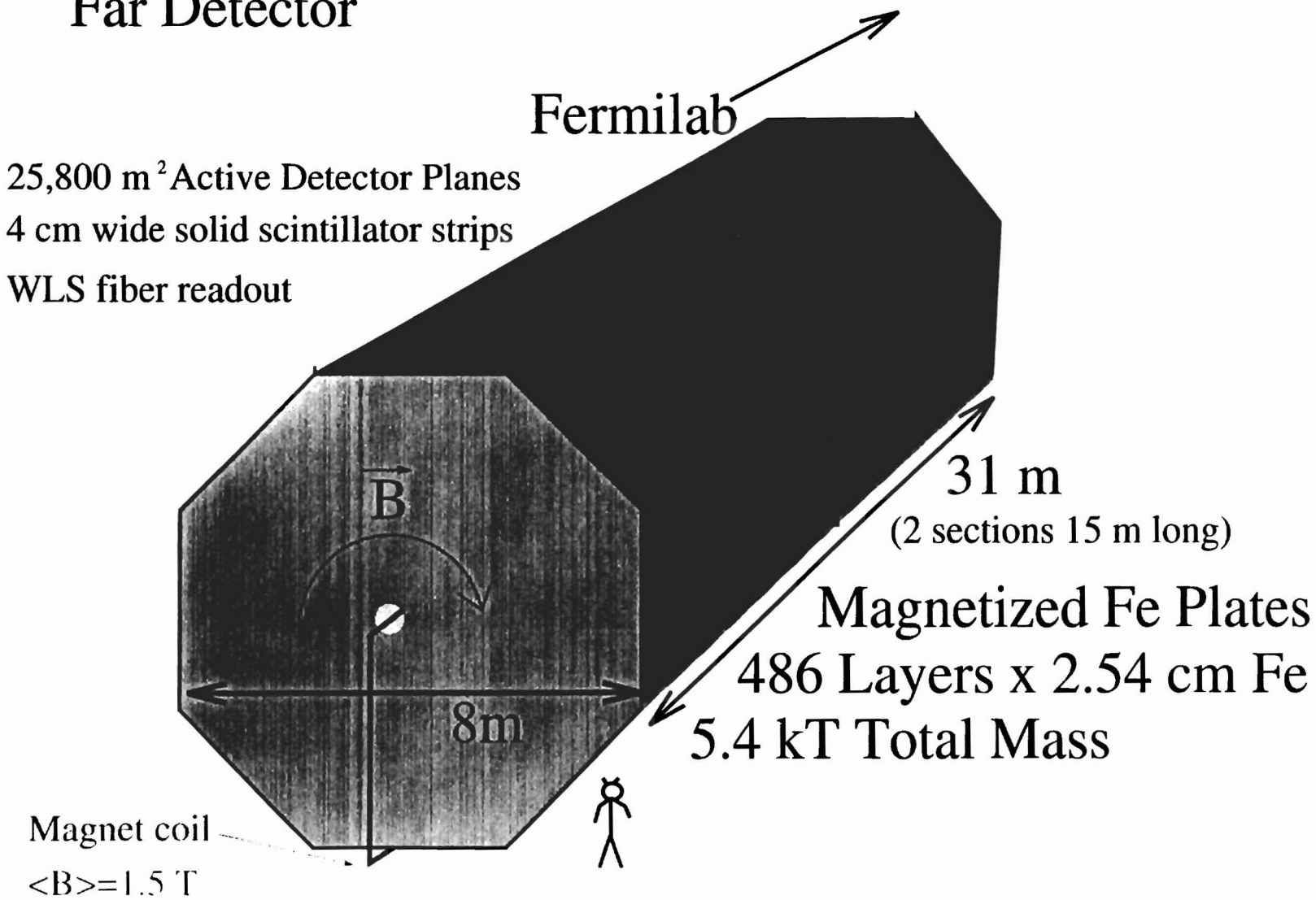
Experimental observation of ν_τ charged-current interactions requires high proton intensities at high energy and extremely good detector resolution. An 800 GeV primary proton beam from the Fermilab Tevatron in conjunction with a high-resolution active target meets these requirements. In E-872 we will produce tau neutrinos in a beam dump and directly measure ν_τ charged-current interactions by observing τ production and subsequent decay in an emulsion target. This is the same technique currently being used to search for the $\nu_\mu \rightarrow \nu_\tau$ oscillations in the CERN CHORUS experiment and is also proposed for the Fermilab Main Injector experiment, COSMOS. Since E-872 will see the signal the oscillation experiments *hope* to observe, we view E-872 as an important step in addressing the exciting question of neutrino mass and mixing.

Tau neutrinos are produced predominantly from the leptonic decay of the D_s meson in the decay sequence $D_s \rightarrow \tau + \nu_\tau$, $\tau \rightarrow \nu_\tau$. In this experiment D_s mesons will be produced by 800 GeV protons interacting in a tungsten beam dump. Both the D_s and the daughter τ will decay in the dump, each decay producing one ν_τ. The number of ν_τ per incident proton which will be produced in the beam dump through this process is 1.7×10^{-4}. The number of ν_τ charged-current interactions that will occur per centimeter of target material is determined by the ν_τ energy and interaction cross section. Because of the energy dependence of the ν_τ cross section, the neutrinos from each of the decays ($D_s \rightarrow \tau + \nu_\tau$, and $\tau \rightarrow \nu_\tau$) have very different interaction probabilities. Their energy spectra are determined by the x_f dependence of the D_s production

cross section. An effective interaction cross section of 0.42×10^{-37} cm^2 can be used to estimate the interaction yield. Within a solid angle acceptance of ±7.1mr this gives 5.0×10^{-18} ν_τ charged-current interactions per centimeter of emulsion ($\rho = 3.72$ g/cm^3) per proton. Taking into account all other sources of ν_τ, such as secondary production from charm, $D^\pm$ decays, B-meson decays increases this number by 14% to 5.7×10^{-18} ν_τ charged-current interactions per centimeter of emulsion per proton. For the run which ended in September, we used seven emulsion modules that correspond to an average installed target mass of 260 kg. We accumulated about 5×10^{17} protons in the dump and expect about 100 ν_τ interactions in our targets. Details of the yields from the 1997 run are given in the proposal for continuing E-872 in the 1999 fixed-target run.

MINOS (Main Injector Neutrino Oscillation Search)

Far Detector



E-875 (Wojcicki) Main Injector Neutrino Oscillation Search

ANL, Athens (Greece), Caltech, Fermilab, Harvard, IHEP/Beijing (China), IHEP/Protvino (Russia), Indiana, ITEP (Russia), JINR (Russia), Lebedev (Russia), LLNL, Minnesota, Oxford (Great Britain), Pittsburgh, Rutherford (Great Britain), Stanford, Sussex (Great Britain), Texas A&M, Texas/Austin, Tufts, Univ. College London (Great Britain), Western Washington

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^{-2} or lower in both Δm^2 (eV^2) and $\sin^2(2\theta)$, using neutrinos produced by the Fermilab Main Injector beam and a large new detector located at the Soudan Mine in Minnesota, some 730 km away. The existing Soudan 2 detector at the same site will 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 emphasizes the investigation of neutrino interactions with energies sufficiently above the tau production threshold so that the presence of $\nu_\mu \rightarrow \nu_\tau$ oscillations can be convincingly demonstrated. One of the signals for $\nu_\mu \rightarrow \nu_\tau$ oscillations in our experiment relies on a measurement of ν_τ charged-current events and the subsequent tau decay. In addition, we shall perform several independent measurements which will be sensitive to both $\nu_\mu \rightarrow \nu_\tau$ and $\nu_\mu \rightarrow \nu_e$ oscillations. Most of our tests will rely on near-detector/far-detector comparisons in order to minimize uncertainties due to imperfect knowledge of the neutrino beam energy spectrum and the detector responses.

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, in collaboration with Fermilab, we are designing a neutrino beamline that is capable of operating in several modes. The two extremes would be a wide-band beam which maximizes neutrino flux at the far detector and a narrow-band beam, which has lower flux, but is concentrated near one energy. In response to recent results from the Super-Kamiokande experiment, the collaboration has recently begun a design study of a beam optimized for low-energy neutrinos, in order to extend MINOS sensitivity to lower Δm^2 values. Such flexibility would allow us to respond in an appropriate way to whatever may be the physics situation at the time of the startup of the experiment.

The MINOS experiment uses two very similar detectors, one at Fermilab and one in Minnesota's Soudan mine, 730 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 1.8 kT near detector at Fermilab has 6 m wide octagonal planes; the 5.6 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 1.5 T. We estimate that, in the absence of oscillations, the far detector would record about 16,000 charged current ν_μ interactions annually using a wide-band beam. In addition, the existing 1 kT Soudan 2 detector will allow a complementary study of neutrino interactions, with much finer granularity but lower statistics.

The currently existing laboratory in the Soudan Mine will be expanded to house the new detector, as shown in Figure 1. Excavation of the new underground laboratory is scheduled to begin in May 1999. Civil construction for the NuMI facility at Fermilab, including the MINOS near detector hall, is also expected to begin soon thereafter. The current schedule calls for data-taking to begin with the near detector and the first third of the far detector when the NuMI neutrino beam turns on in the year 2002.

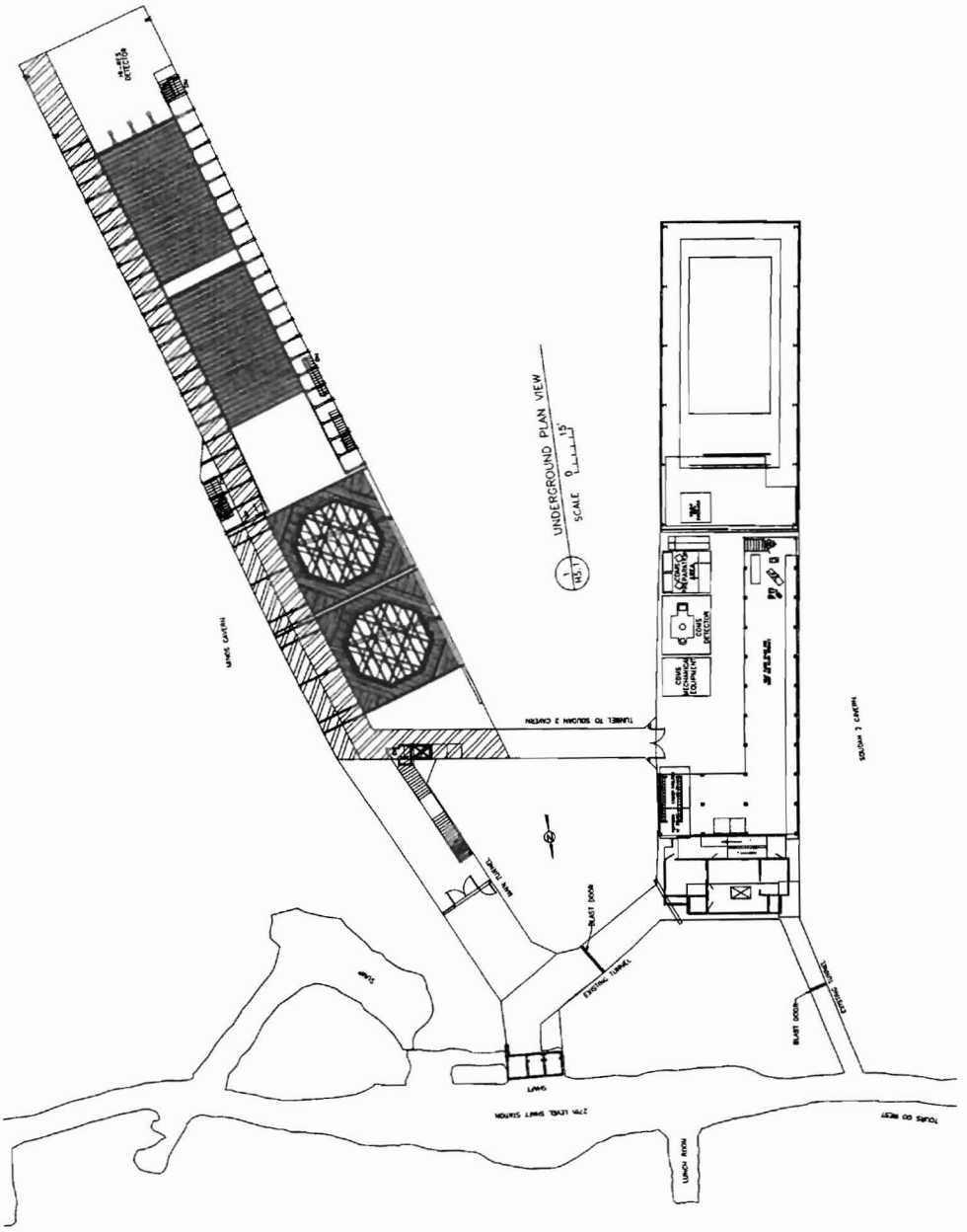
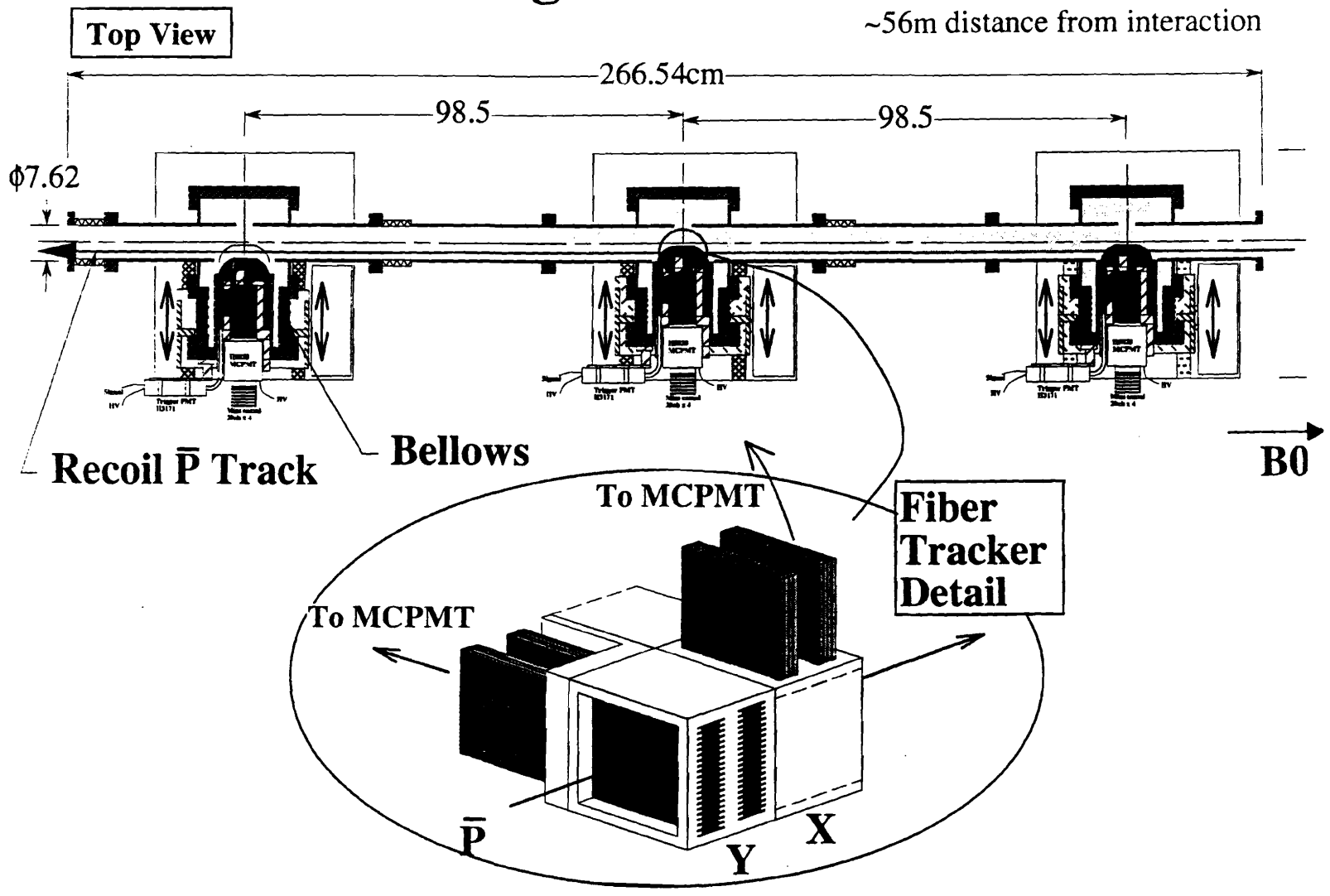


Figure 1. Plan view of MINOS detector in the Soudan Mine.

Roman Pot Arrangement



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*

The purpose of this experiment is to search for and study events in which an antiproton is diffractively scattered, i.e. by pomeron exchange, and a hard interaction takes place at the pomeron-proton vertex. Such interactions would be characterized by the production of high E_T jets, W or Z, or heavy flavors (b or c). Measurements of these jets or heavy particles in the CDF detector, together with existing knowledge of the structure of the proton, give information about the parton structure of the pomeron, if that concept is meaningful. From an extensive set of measurements one can derive separately the gluon and quark distribution functions for different values of t, the (negative) squared mass of the pomeron. This is complementary to studies with photon-pomeron collisions at HERA (ep); inconsistencies are expected by some theorists who point out that the pomeron is not like a normal (time-like) hadron. Whatever it is, it plays a major role in hadronic interactions and these experiments should shed some light on its nature.

Diffractively scattered antiprotons have very small angles with respect to the outgoing beam and stay in the beam pipe. Those that have lost a small fraction (say 5%) of their energy in exciting the proton to a few hundred GeV (the pomeron-proton C.M. energy) are dispersed horizontally by the Tevatron dipoles. Small detectors are placed close to the beams, 57 m from the collision point, to measure these antiprotons. The detectors are hodoscopes of scintillating fibers, in x and y orientations, backed up by a square 2 cm x 2 cm trigger counter. There are three such detectors separated by 1 m mounted in vacuum pots ("Roman Pots") which enable the detectors to move in to within about 7 mm of the circulating beam while they remain at atmospheric pressure and accessible. The scintillating fibers are read by multichannel (80 channels) PMTs, and the hodoscopes have a resolution of about 100 microns. Together with the interaction point (vertex) from the CDF detector this gives a momentum resolution of approximately 0.2%. The t-coverage depends on the diffractive mass; it extends from t = 0 to t = -2 GeV^2 at M = 360 GeV when $\sqrt{s}$ = 1800 GeV.

The diffractive events should also have a rapidity gap close to the antiproton, i.e. an angular region devoid of particles. Many diffractive studies use this gap alone as a signature for diffraction. We added two small calorimeters, called "microplugs," around the beam pipe in CDF to be able to

correlate the gap information with the scattered antiproton. The microplugs are octagonal cylinders, with 8 lead/scintillator cells. The full CDF detector is used to measure central jets, heavy flavors, Drell Yan and W/Z produced diffractively and also to search for new phenomena.

Data were taken in December 1995 - February 1996, and high E_T jets and some W events have been observed. These are now being analyzed in detail.

E-881

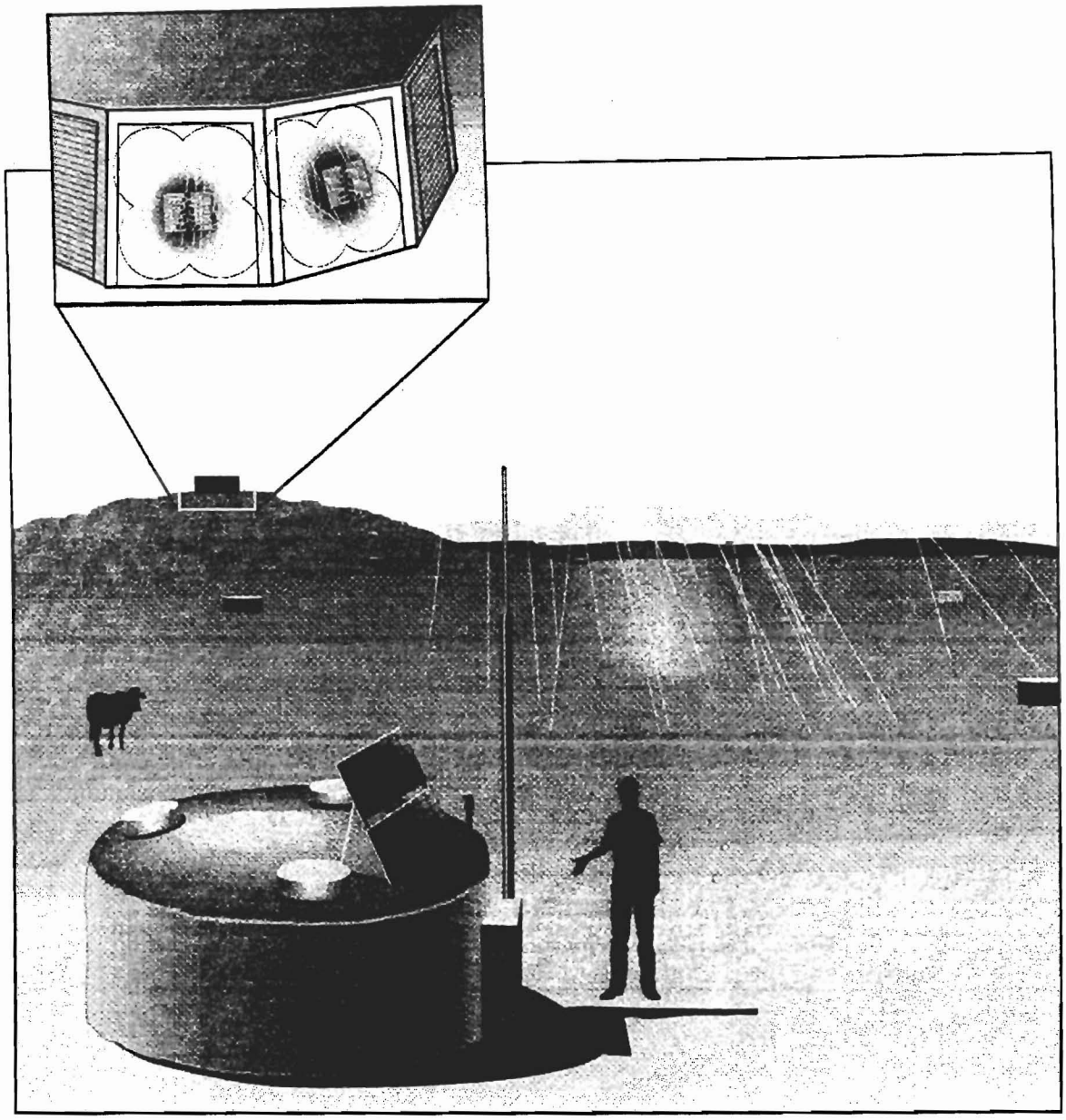


Illustration of the detector systems used in the Pierre Auger Project. Self contained particle detectors are spaced on a 1.5 km grid over the surface. The air showers are also observed on dark nights using air fluorescence telescopes (inset).

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

Fermilab
(and institutions in 19 countries)

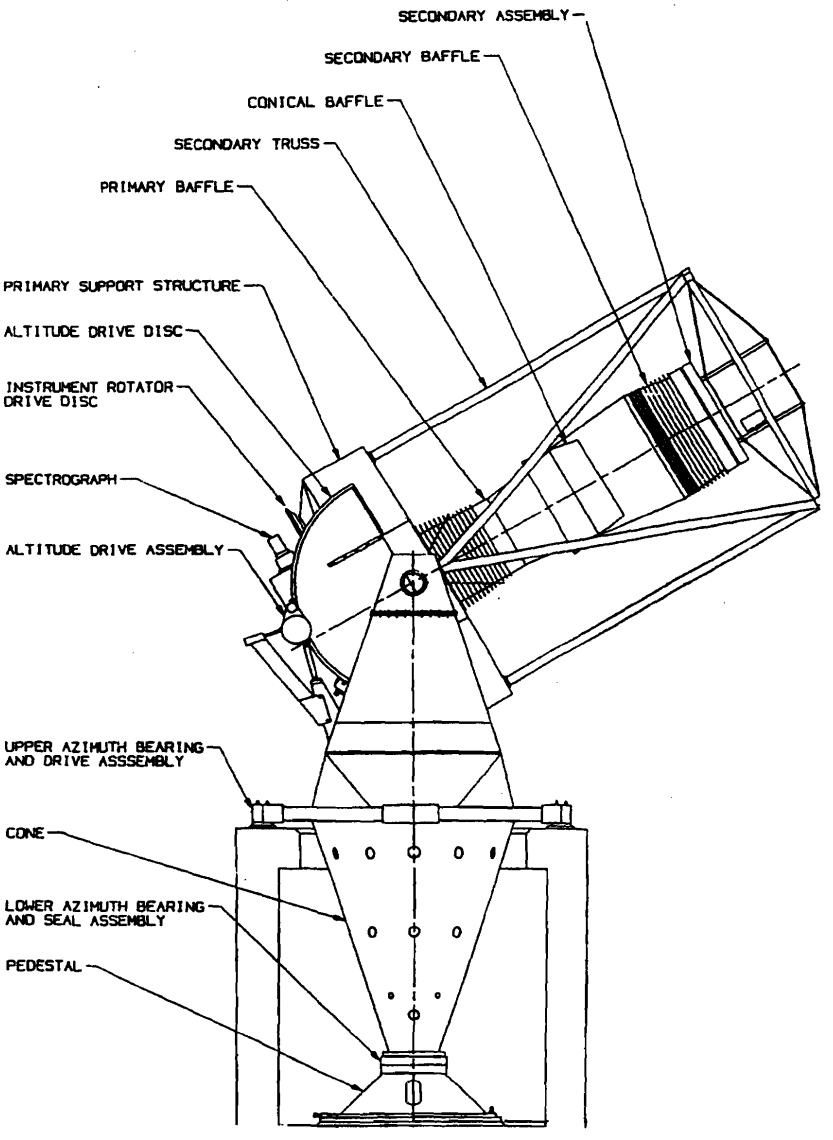
Status: *No Data Yet*

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. Construction of the southern Auger detector in Mendoza, Argentina will begin in 1999 followed by construction of the northern detector in about 2002. Both detectors should be complete in six years. Commitments for funds for the southern detector including those from the US DOE and NSF are nearly in hand.

Fermilab will play an important role in the Auger Project. In addition to scientific participation, Fermilab could bring 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 will also participate in the development of the central data acquisition system. The overall project management for the Auger Project will be based at Fermilab.

E-885


SECONDARY ASSEMBLY
SECONDARY BAFFLE
CONICAL BAFFLE
SECONDARY TRUSS
PRIMARY BAFFLE
PRIMARY SUPPORT STRUCTURE
ALTITUDE DRIVE DISC
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/Heidelberg [Germany], 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 undergoing commissioning tests 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.

"First light" for the SDSS was achieved in May 1998 with the successful acquisition of the first scans with the main imaging camera. The first data have been used to make adjustments in the detector positions in the camera and in the collimation of the telescope optics. Approximately 200 square degrees of sky have been surveyed during this commissioning phase. The scans were processed with the image identification and measurement pipeline, allowing early science analysis. Among the more spectacular first results was the discovery of the most distant known quasar (as determined from a spectrum obtained with another telescope). Meanwhile, components of the SDSS spectroscopic system and the telescope control system continue to be installed, with the expectation that the first redshifts will be obtained in 1999.

Fermilab role:

The project will produce at least 10 Terabytes of data in five years of operation (each long, clear night will yield 200 GBy of raw data). The implementation of the end-to-end data system to handle this volume of data has been assigned to Fermilab. This includes design and construction of the data acquisition system (on the mountaintop at Apache Point), and the specification and responsibility for running the production system (in the Feynman Computing Center at Fermilab). The scientific coding is being undertaken by scientists at the participating institutions (including Fermilab). The design and implementation of the code management system, the promulgation of standards, and the computing framework in which the scientific code runs, are also Fermilab's responsibility.

In addition to the computing infrastructure, Fermilab is an active contributor to a number of other aspects of the project. Fermilab is responsible for the design and implementation of the telescope motion control system; the design and implementation of the telescope equipment protection interlock system; and the development of several smaller sub-systems associated with telescope operation. Fermilab is also involved in developing systems and hardware associated with the telescope instruments, including the design and development of instrument handling equipment; design and implementation of an automated instrument change system; and the development of an automated system that identifies and maps the location of optical fibers randomly plugged into the fiber cartridge focal-plane plates.

Publications

The Spectroscopic Survey of the SDSS, R. G. Kron, in "Wide-Field Spectroscopy," eds. E. Kontizas et al., p. 41 (1997).

The Sloan Digital Sky Survey: Pi on the Sky, H. J. Newberg, Beamline 27, No. 3, p. 22 (1997).

Three-Dimensional Parameterization of the Stellar Locus with Application to QSO Color Selection, H. J. Newberg and B. Yanny, Astrophys. J. Suppl. 113, 89 (1997).

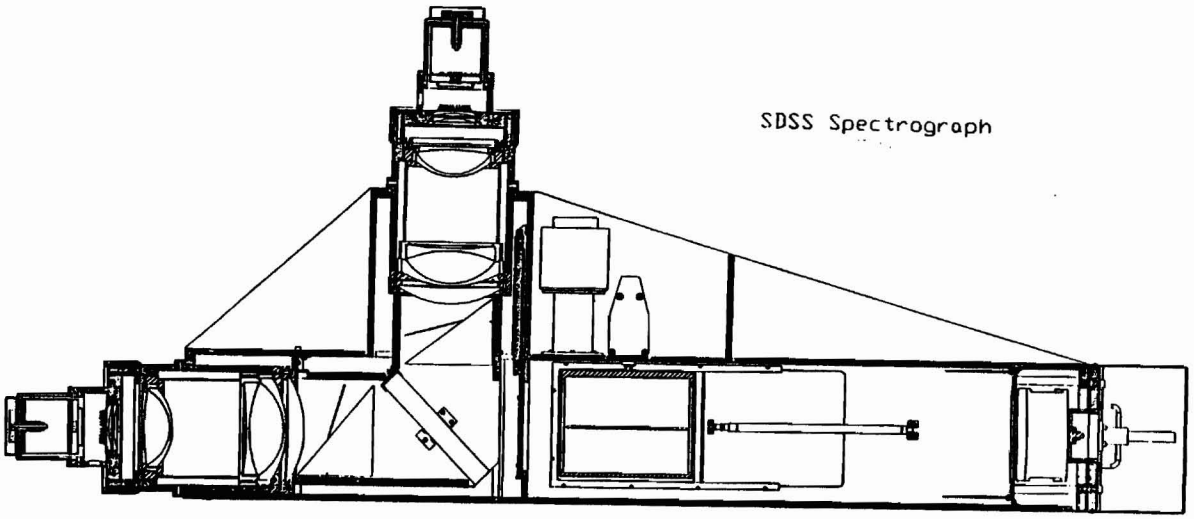


Figure 1

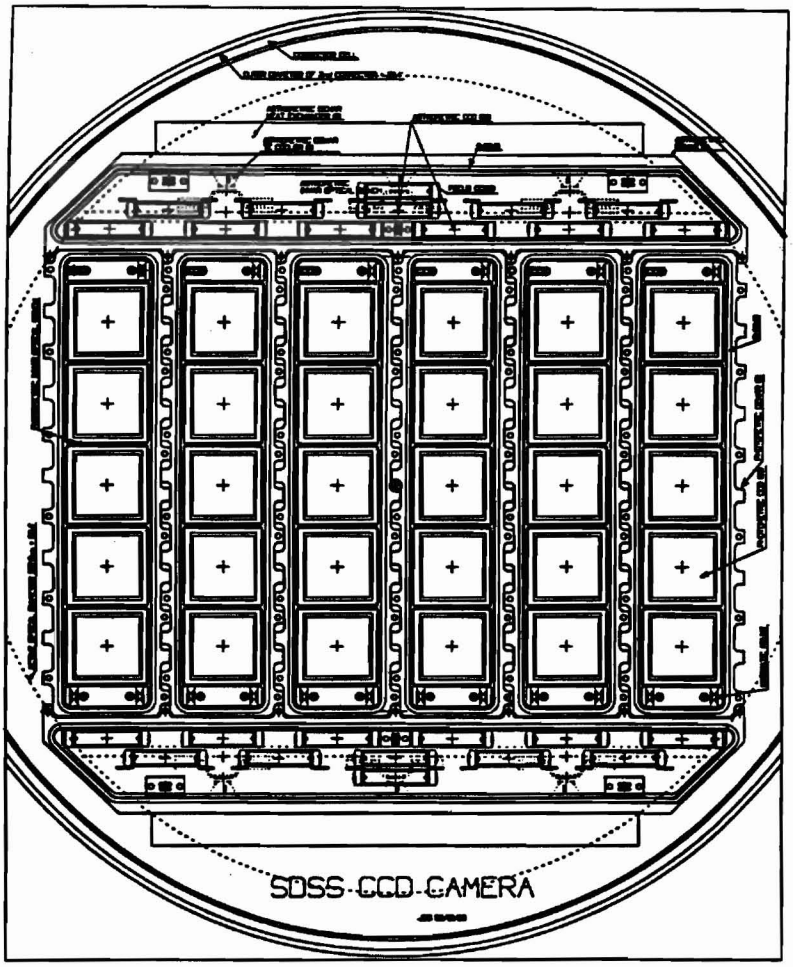
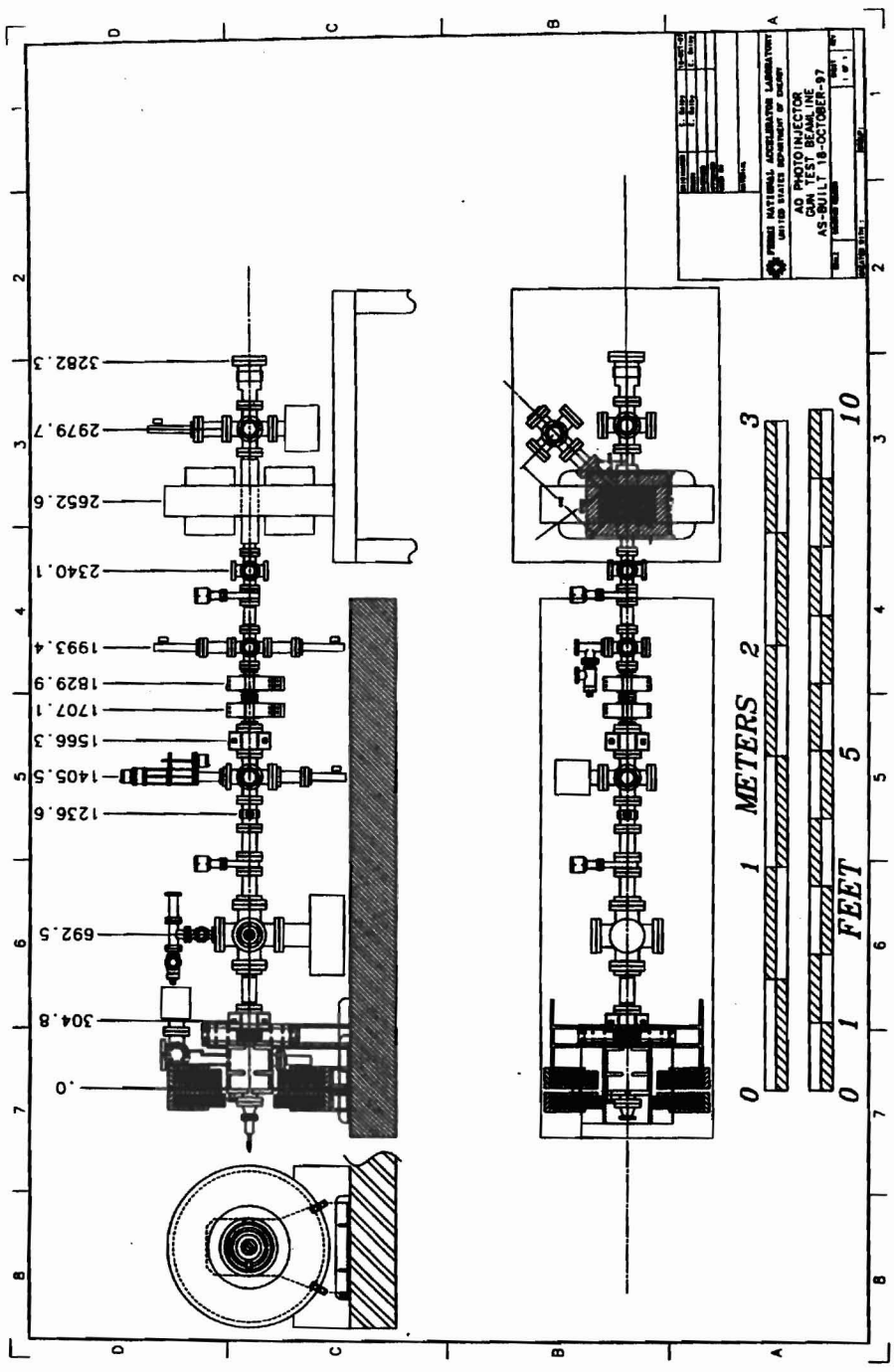


Figure 2

E-886


FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY
A0 PHOTOINJECTOR
GUN TEST BEAMLINE
AS-BUILT 18-OCTOBER-97
3282.5
2979.7
2652.6
2340.1
1993.4
1829.9
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1405.5
1236.6
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0 1 METERS 2 3
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E-886 (Colestock / Melissinos) Experiments at the A0 Photoinjector

Fermilab, Rochester

Status: *Data-Taking*

The A0 photoinjector delivered electrons from the rf gun for the first time in June 1997. The beam is designed for a pulse train of up to 800 short (10 ps wide) electron bunches of 8 nC charge each. Initially the energy was 3.5 MeV and the pulse train has been limited to 200 pulses because the drive laser was not completed; a typical pulse train is shown in Figure 1. Following the commissioning of the superconducting capture cavity, the beam reached 18 MeV in the fall of 1998. Further running is scheduled for the spring of 1999.

The quantum efficiency of the Cs_2Te cathode supplied by INFN/Milano has been characterized under varying conditions of laser illumination and rf acceleration. A typical measurement of the quantum efficiency is shown in Figure 2. Measurements of the energy spread and emittance of the beam will continue. For a more extensive description see also FermiNews, November 13, 1998 (p.8) "Super-Cool Cavities."

The first series of experiments planned with the photoinjector are as follows:

(a) Optoelectronic measurements of the electron beam bunch length with picosecond resolution (Ph.D thesis topic of M. Fitch).

(b) Study of the beam dynamics and long pulse operation of the injector with a superconducting cavity (Ph.D thesis topic of J P. Carneiro).

(c) A crystal-channeling experiment to identify channeling radiation at high beam intensities.

Publications

Laser System for a High Duty Cycle Photoinjector, A. Fry et al., to be published in Nucl. Instr. and Meth.

Beam Transport, Acceleration and Compression Studies in the Fermilab High Brightness Photoinjector, J. P. Carneiro el al., FERMILAB CONF-98/329.

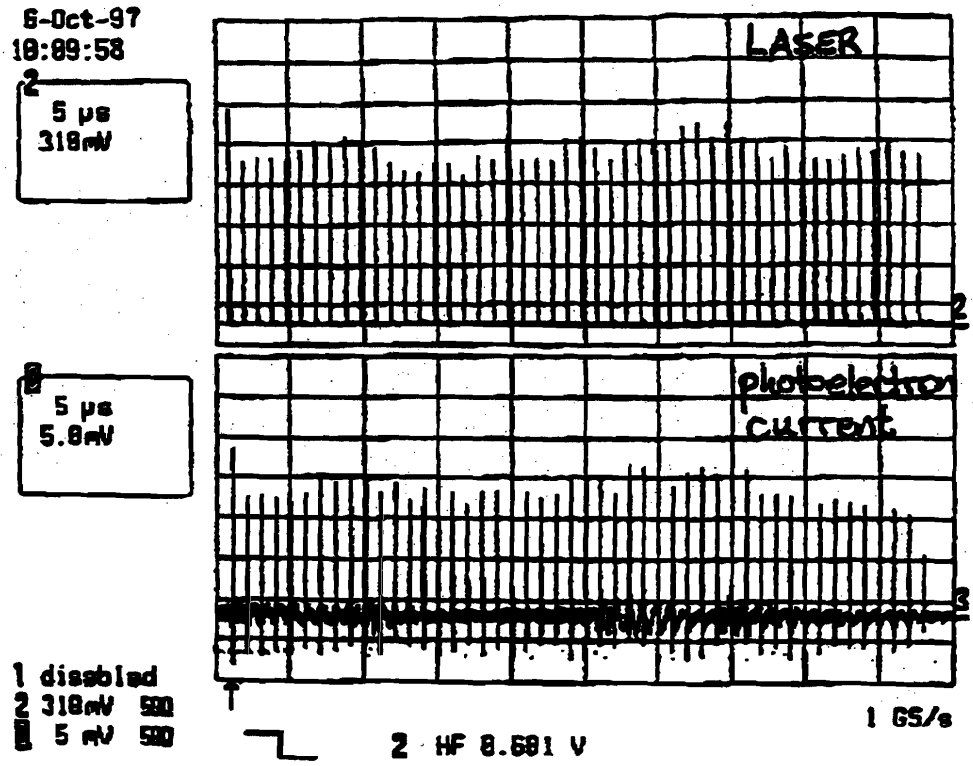


Figure 1. Typical pulse trains of the A0 photoinjector.

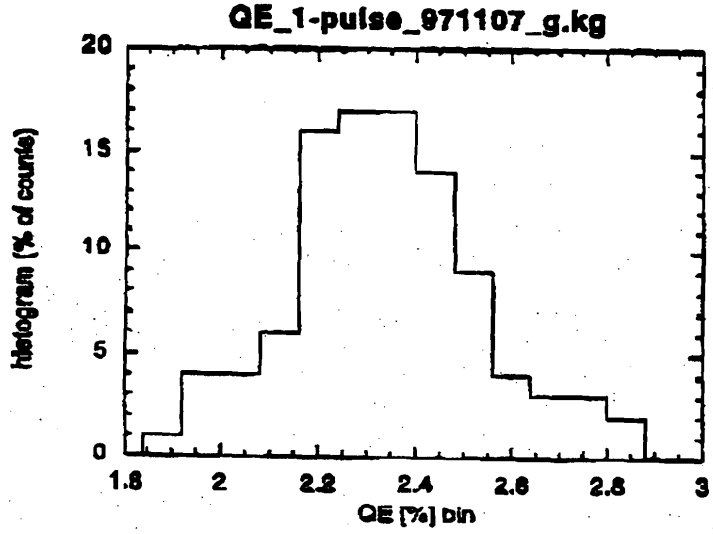
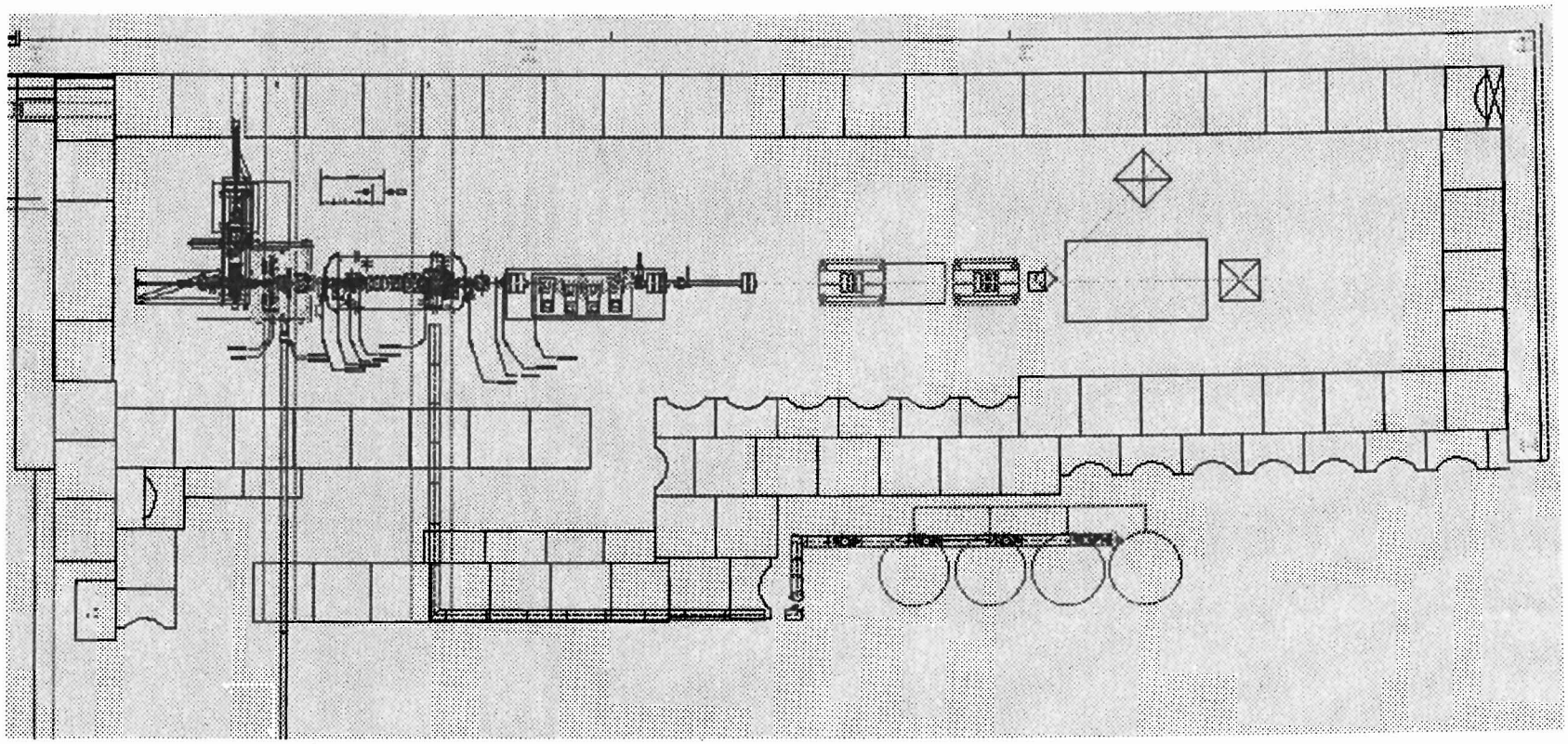


Figure 2. Typical measurement of the quantum efficiency of the Cs_2Te cathode.



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) Advanced Accelerator Test at the Fermilab Electron Source Facility

UCLA, Fermilab

Status: *No Data Yet*

A new set of experiments is proposed which uses accelerator facilities now under construction at Fermilab to accomplish several scientific objectives. The core of the facility is a short-bunch, long-pulse photoinjector, which can produce a train of intense electron bunches. Owing to the uniqueness and versatility of this facility, it can be used for multiple purposes in both accelerator and basic physics research.

There is widespread interest in developing high-gradient accelerating structures to pave the way toward more compact and affordable high energy accelerators. However, high-gradient acceleration is by nature faced with three problems to be solved: 1) to find a suitable structure or medium to support a high electric field for accelerating test particles using immediately available power sources; 2) to find methods to manipulate and synchronize intense beams for acceleration once the electric field is produced; and 3) to develop efficient compact power sources to couple energy from the external world to the accelerating structure, allowing staging of acceleration sections. In this proposal, we outline an experiment that can be performed at Fermilab, where staging of GeV/m accelerating sections can be demonstrated for the first time, using wakefields in plasmas driven by ultra-high brightness electron beams[1].

The plasma wakefield accelerator (PWFA) concept is based on the excitation of a steep field gradient in a plasma due to the injection of an intense drive electron beam, followed by a witness bunch which is to be accelerated. A promising regime which offers the most freedom from sources of instability and includes intrinsic linear focussing properties can be realized by the injection of an intense drive electron bunch into an underdense plasma, creating a symmetric focussing channel, the so-called electron blowout regime. Recent experimental work by the UCLA team at Argonne has shown effective generation of such channels, along with a significant acceleration gradient[2].

Perhaps the most important experiment to be undertaken in this area is that of synchronization of the witness bunch with the wakefields generated by the excitation bunch. Recently, it has been proposed that magnetic compression of an rf photoinjector beam can be applied to effectively reduce injection jitter from the witness beam that has plagued previous attempts at acceleration[3]. Such a scheme (shown schematically in the figure) would enable a first real attempt at synchronization and low-emittance, low-energy-

spread acceleration - with the possibility, currently unique to the Fermilab facility, of staging the accelerating sections.

The components of the experimental program envisioned are:

a) Demonstrate synchronization of a witness beam with the beam-generated wakefields in the blow-out regime of the PWFA, using an rf photoinjector with a bunch compression system;

b) Demonstration of GeV/m acceleration;

c) Understand the beam matching physics between successive modules of a multiple stage scheme. This includes the development of effective kickers or other schemes for merging drive and witness beams, and understanding of the beam dynamics; and

d) Demonstrate multiple stage acceleration using the PWFA; determine physics of intensity and gradient scaling, diagnose beam quality after each accelerating section.

The physical demands on the Fermilab facility for this project would be minimal. The basic experimental setup, as shown in the figure, consists of a plasma chamber at the end of the photoinjector/linac section. The primary diagnostics for the experiment are based on the Compton scattering apparatus described in E-886. It is envisioned that the work will proceed in two phases: the first phase will be the diagnosis of the accelerating channels produced by the drive beam, including demonstration of acceleration. A second phase would involve the demonstration of successful coupling of two stages.

References

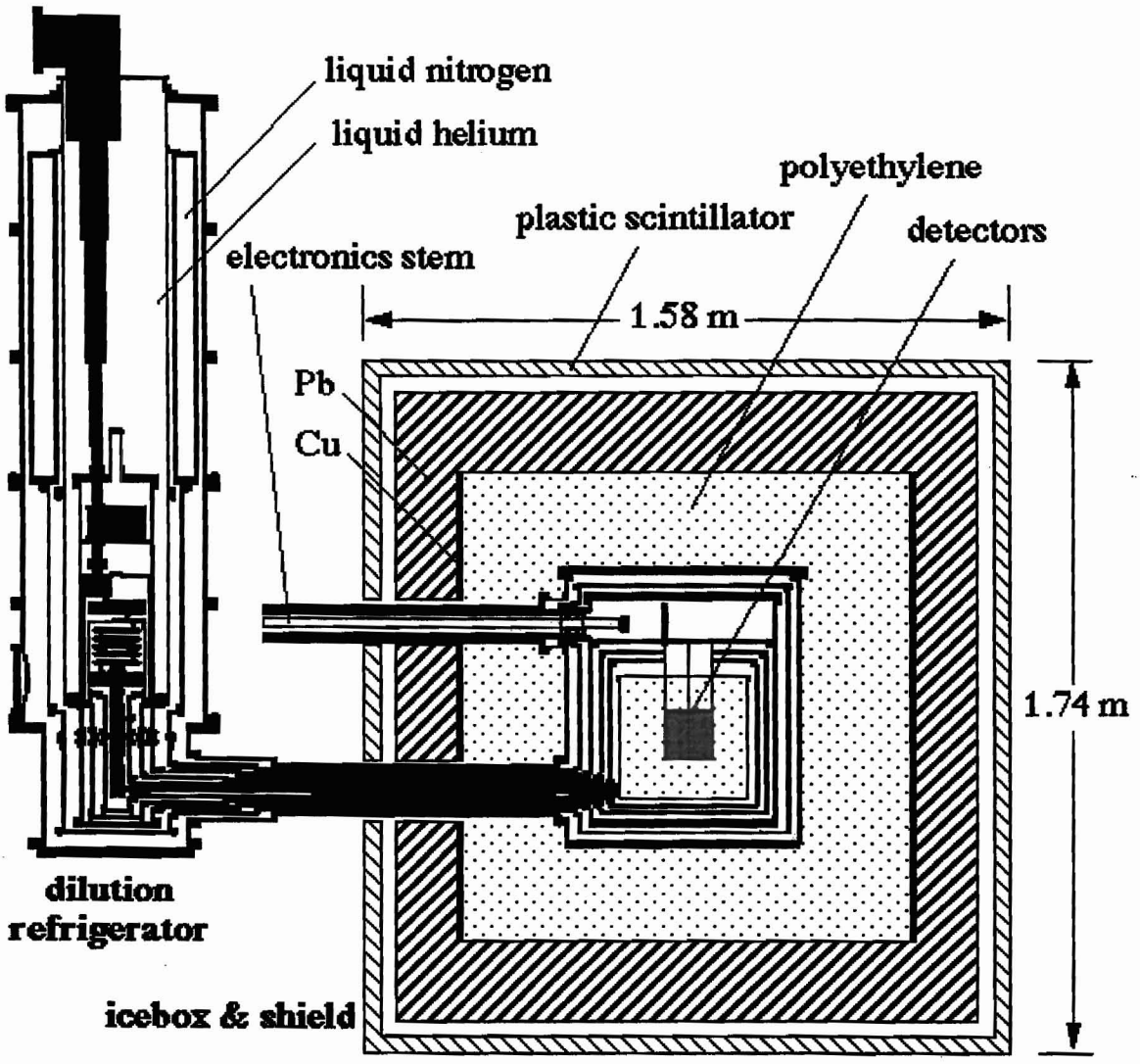
1. J. B. Rosenzweig, Proc. Linear Accelerator Conference, Chalk River, AECL-10728, (1993).

2. N. Barov, et al., Proc. Particle Accelerator Conference, Dallas (1995).

3. J. B. Rosenzweig, N. Barov, and E. Colby, IEEE Trans. Plasma Science 24, 2, (1996).

E-891

CDMS I


liquid nitrogen
liquid helium
polyethylene
plastic scintillator
detectors
electronics stem
1.58 m
Pb
Cu
1.74 m
dilution
refrigerator
icebox & shield

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

Fermilab
(and UC/Berkeley, UC/Santa Barbara, Case Western Reserve, INR/Baksan (Russia), LBNL, LLNL, NIST/Boulder, Princeton, San Francisco State, Santa Clara, Stanford)

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. However, although the CDMS experiment is expected to be a factor of 30 more sensitive than previous searches, this first-generation experiment has only sufficient sensitivity to explore a small region of the interesting parameter space. The second-generation experiment, CDMS II (see Figure 1), will be a larger version of CDMS I, with a further factor of 30 improved sensitivity. This will enable us to explore for the first time a substantial region of the interesting parameter space. CDMS II will be installed in the low background environment of the Soudan mine in Minnesota. Currently, funding is being sought for CDMS II.

Status

During 1998 the CDMS I experiment continued to run in the Stanford Underground Facility (SUF). There were two primary objectives to the running. The first was to continue to test and refine the detectors, and the second was to collect enough data to set competitive limits on the existence of WIMP dark matter. As 1999 begins, data-taking continues for both of these objectives.

Furthermore, preparations are being made to construct the CDMS II experiment in the Soudan Laboratory. The first item of business there is to install two clean rooms, an equipment room, and an electronics room, in preparation for the installation of the experiment itself. Contracts are now being prepared and bid on all of these items. While this is going on at Soudan, the Icebox, or cryostat, for CDMS II is being pre-fit and tested at Fermilab. Parts have already been machined and electron-beam welded, and only one of the cans has not been returned from the vendor. Final assembly of the Icebox will take place in the Soudan Laboratory in the fall of 1999. It is also expected that the dilution refrigerator and the remainder of the cryogenic system will be installed at that time.

Meanwhile, preparations are being made on the west coast to optimize the detectors for CDMS II and to begin full scale production. This should happen before the end of 1999. The first detectors for CDMS II will arrive at Soudan for installation in the late spring or early summer of 2000.

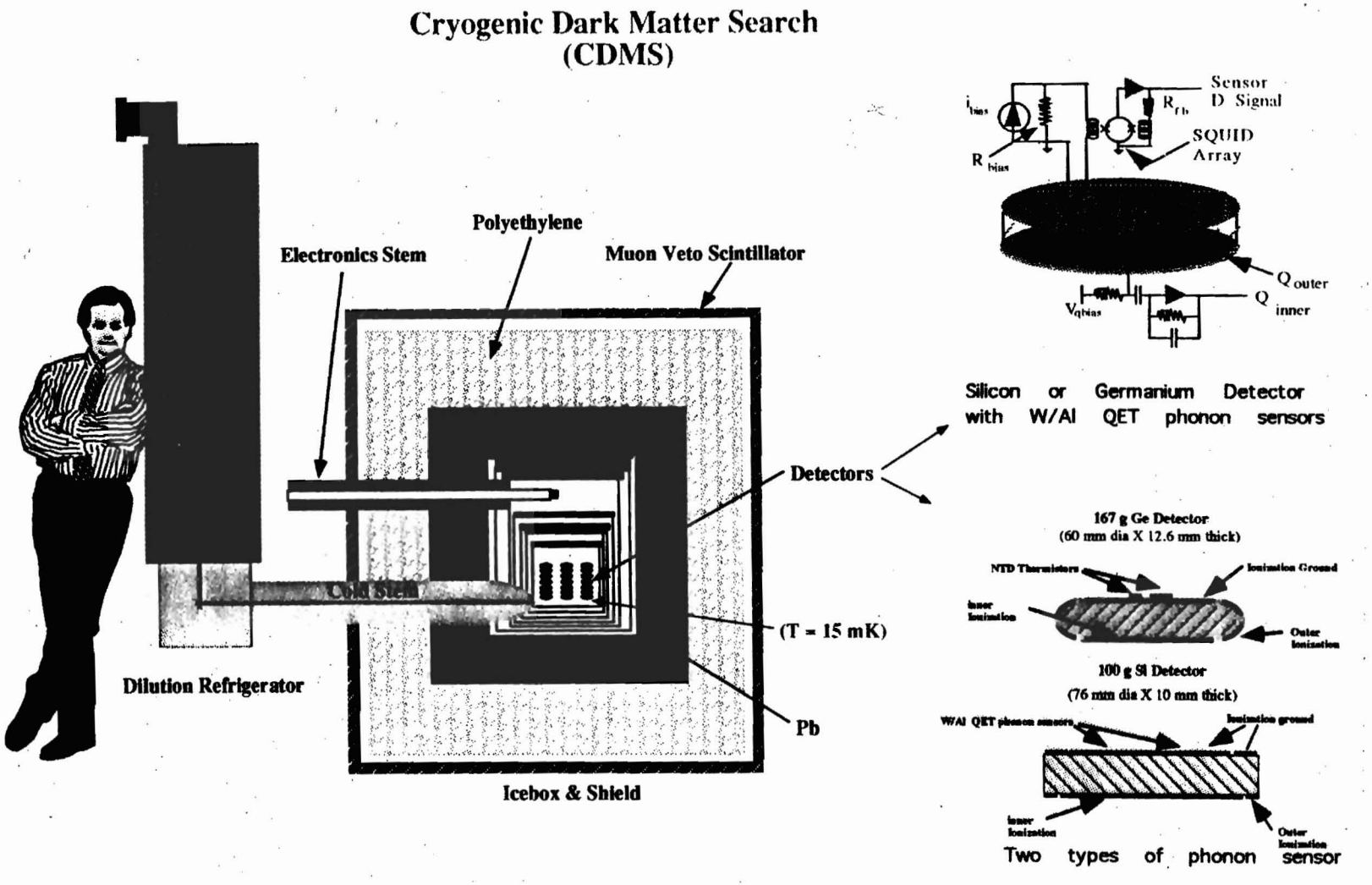
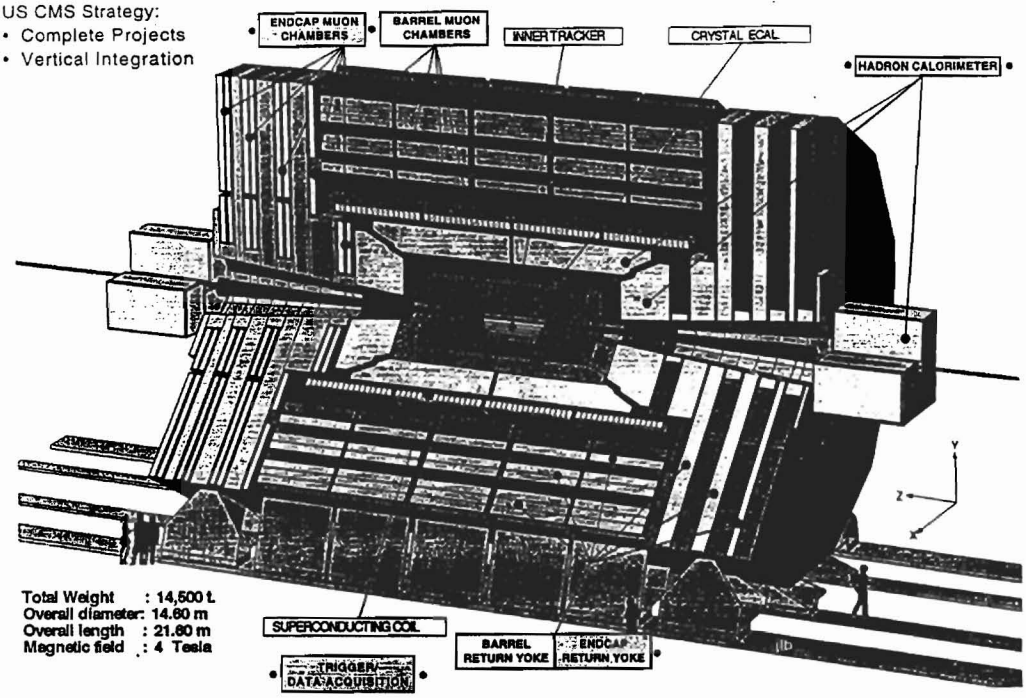


Figure 1. CDMS II will consist of 42 silicon and germanium crystals operating at .015 K to detect phonon and ionization signals which are generated as Weakly Interacting Massive Particles (WIMPS) scatter from the nuclei in the crystals. The detectors will be installed in the Soudan Mine in Tower, Minnesota.

E-892

US CMS Management Responsibilities

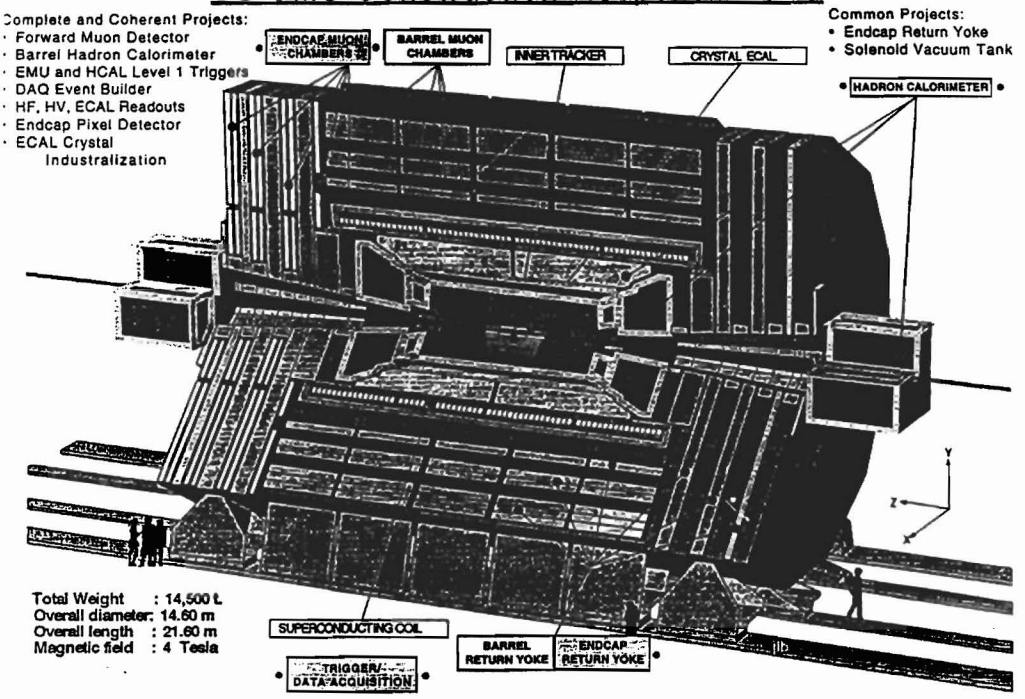
US CMS Strategy:
- Complete Projects
- Vertical Integration



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 (Green) The US CMS Collaboration at Fermilab

Fermilab
(and 38 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 **S**olenoidal magnet. This design allows for a **C**ompact design allowing optimal **M**uon 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 1700 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 360 physicists and engineers from 39 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 was taken in 1995/96/97/98 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 and EMU. All subsystems, except trigger/DAQ, produced full Technical Design Reports in 1997 and 1998, and some subsystems have fabricated preproduction prototypes. The CMS Fermilab group is heavily involved both in test beam R&D and in engineering design. The HCAL Technical Design Report was written at Fermilab and submitted to CERN in July 1997. The EMU Technical Design Report was partially written at Fermilab and submitted in December 1997.

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, and the pipelined electronic readout of all the HCAL devices. 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.

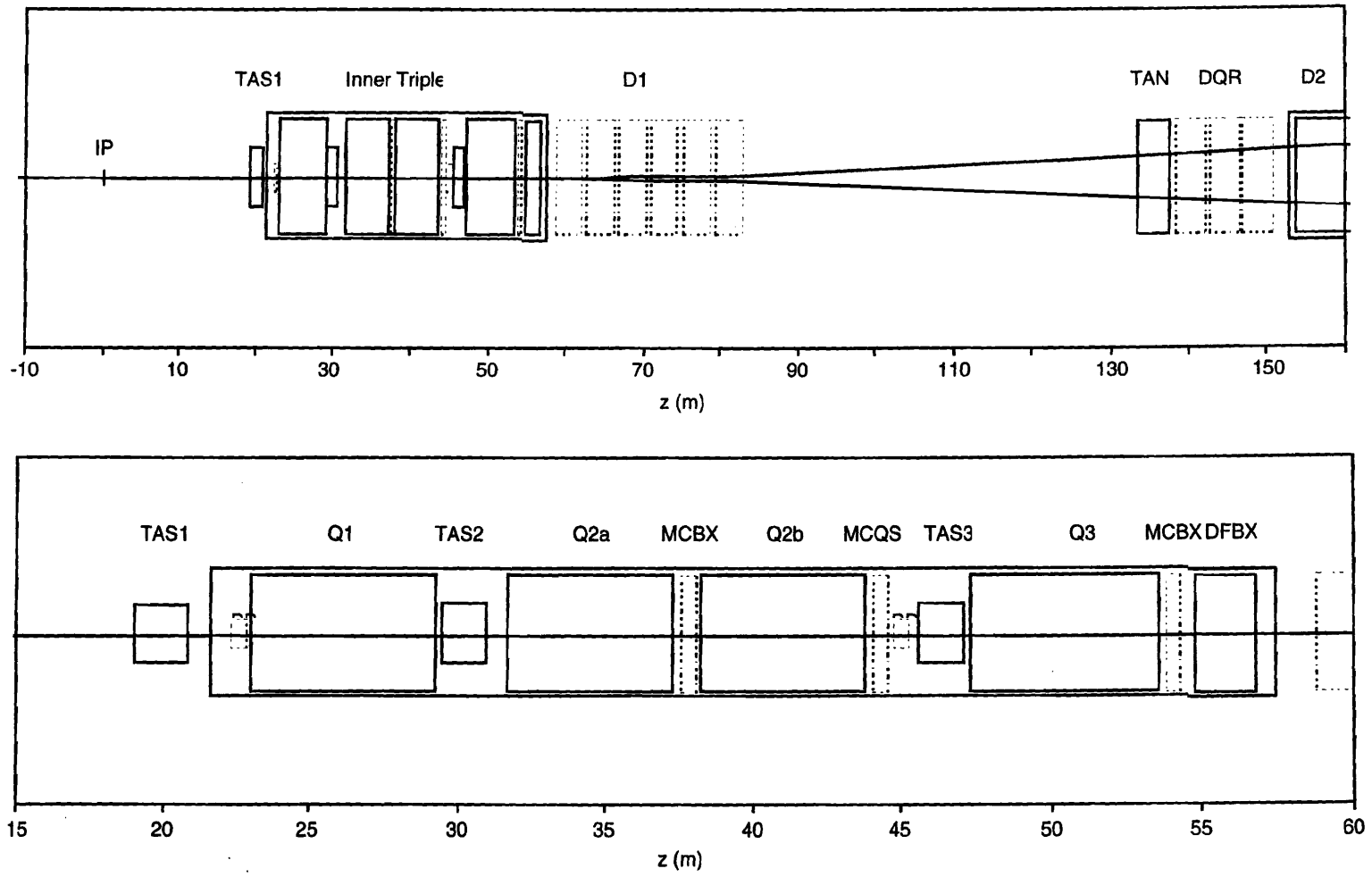
At present, KEK operates a remote control room to enable Japanese physicists to stand shift on CDF. Based on this positive experience, we imagine that a similiar remote control room could be set up at Fermilab in order to enable US physicists to stand shift on CMS. In general, the aim of Fermilab is to enable US CMS physicists to do physics at their home institution or within the U.S. if at all possible.

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. Fermilab is very involved in the engineering analysis of the vacuum vessel, as that device supports the HCAL for which we are responsible. 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 6.0). Fermilab provided equipment is shown by bold outlines, that provided by other US national laboratories by light outlines, and by CERN by 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 contributions through the national laboratories, called the US LHC Accelerator Project, are 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 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 MCQS), 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 IRs 1 (ATLAS) and 5 (CMS), single-aperture (D1) and twin-aperture (D2) beam separation-recombination dipoles, and beam position monitors (BPM). (DQS 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 29 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 well underway. Three model magnets, approximately 30% as long as the magnets required for LHC, have been built and tested[3], and the third was tested twice in two different mechanical configurations. A fourth model magnet is almost ready for test and construction of a fifth is about to begin. Good progress is being made on most of the R&D issues. The field quality of the first three models[4] demonstrates that the required field quality can be achieved. However, the quench performance of the the models is not yet satisfactory. Therefore the current focus of the R&D program is to improve the mechanics of the magnet in order to allow it to reach the operating gradient with little or no training. Design and development of the cryostat is also making good progress. 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 will be run at CERN starting in the second half of 1999. We remain on track for delivery of the first inner triplet to CERN by January 2003 and completion of deliveries by October 2004.

References

1. US LHC Accelerator Project Technical Design Handbook, February 1998, ftp://tdpc01.fnal.gov/TDNT_Server/Public/USLHC/Tdh/USLHC_TDH.pdf.

2. J. Wei, V. Ptitsin, F. Pilat, S. Tepikian, N. Gelfand, W. Wan, J. Holt, US-LHC IR Magnet Error Analysis and Compensation, presented at EPAC 1998, Stockholm, Sweden, July 1998.

ierby, et al., Design, Development and Test of 2m Quadrupole Model .gnets for the LHC Inner Triplet, presented at the Applied .perconductivity Conference, Palm Desert, CA, September 1998.

t. Bossert, et al., Magnetic Measurements of the Fermilab High Gradient Quadrupoles for the LHC Interaction Regions, presented at the Applied Superconductivity Conference, Palm Desert, CA, September 1998.

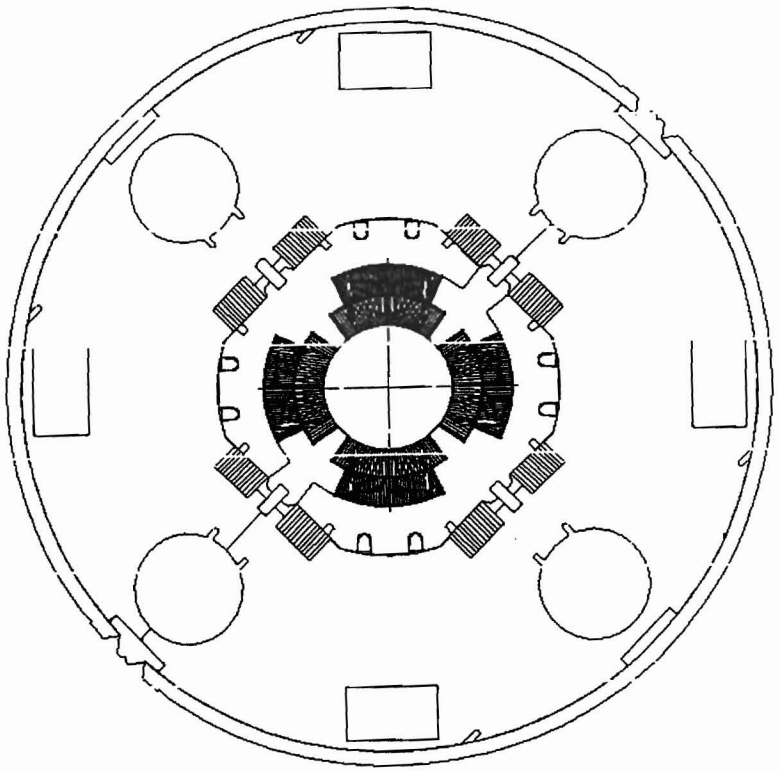
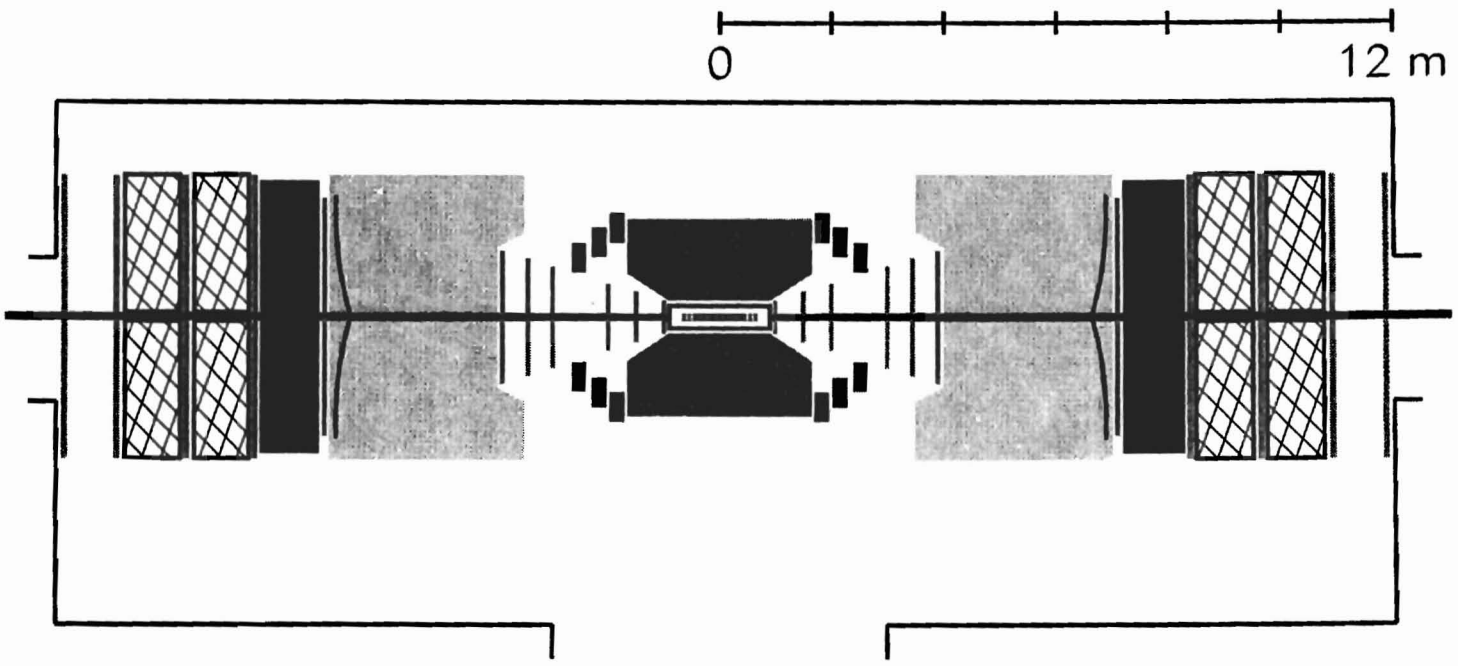


Figure 1. Cross-section of the LHC interaction region quadrupole under development at Fermilab.

BTeV: Horizontal Section at y=0

- Pixel Detector
- Dipole Magnet
- Magnet Coils
- Beam Pipe Vacuum
- Wire Chambers
- RICH
- EM Cal
- Muon Absorber and Toroid



E-897 (Butler / Stone) BTeV R&D

Carnegie Mellon, Colorado, Fermilab, Florida, IIT, Illinois, Indiana, INFN/Milano (Italy), Minnesota, Nanjing (China), New Mexico State, Ohio State, INFN/Pavia (Italy), Pennsylvania, Puerto Rico/Mayaguez, USTC (China), Shandong (China), Syracuse, Tennessee, Tufts, Vanderbilt, Wisconsin, Yale, York

Status: *No Data Yet*

BTeV is now an approved R&D project whose goal is to write and receive approval of a full technical proposal for a program to measure CP violation and rare decays in 2 TeV proton-antiproton collisions in the C0 interaction region.

Violation of CP symmetry in weak decays has only been demonstrated in the decays of the neutral K_L meson. While the so-called "Standard Model" can explain this phenomenon it is by no means clear that the Standard Model explanation is the correct one. Furthermore, the model has many fundamental parameters with no explanation of the relationships between them. Measuring CP violation in b decays offers many more constraints on the model and will provide the crucial tests. CP violation is expected to be very small in charm decays. Finding CP violation at larger than expected levels would show that the model is incorrect. 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 point us to an understanding beyond the model.

We live in a world comprised mostly 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. CP violation likely will provide part of the explanation of how the antimatter disappeared.

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 ~$2\times10^{11}$ $b\bar{b}$ in a "Snowmass" year of running (10^7s). This is a large sample of b's which allows precision measurement of B_s mixing, the CP violating angles α, β, and γ, rare decay branching ratios, and CP violation in rare decays. The charm yields are in principle even higher than the b yields and we can make exploratory searches of mixing and CP violation in charm decays.

BTeV has chosen the "forward" detector geometry shown in the accompanying figure. There are several important advantages. First of all, the large b and charm rates are accompanied by a 1000 times higher background rate. In order to extract the b's we need an efficient trigger which rejects most of the background. To help triggering it is important to get the b's

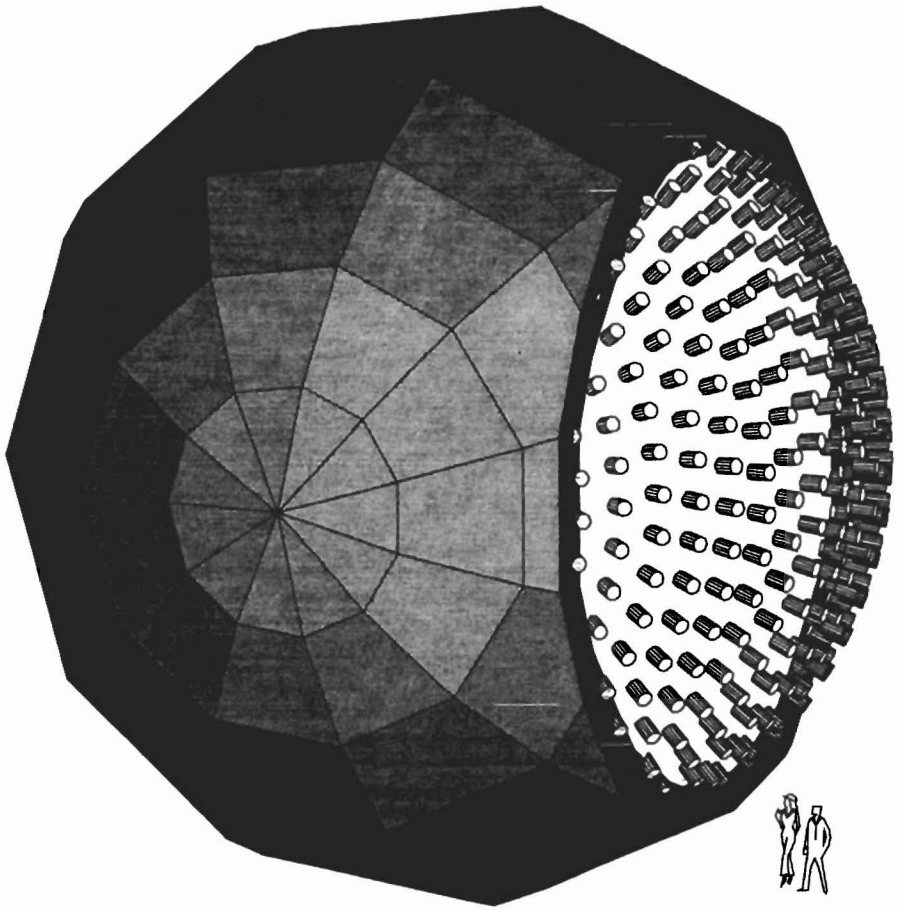
to move at large $\beta\gamma$ in order to defeat multiple scattering. The forward direction naturally selects heavy quarks with large Lorentz boosts. Another crucially important advantage of the forward direction is that it allows space for charged hadron identification using a Ring Imaging CHerenkov detector. The RICH then allows us to virtually eliminate the background in many important decay modes. For example, we reject the larger $B^o \rightarrow K^+\pi^-$ background from $B^o \rightarrow \pi^+\pi^-$. Finally, instrumenting the forward direction costs less than trying to make a large cylindrical detector optimized for the central region.

The R&D issues being considered include triggering, data acquisition, charged particle tracking, electromagnetic calorimeter, RICH, and muon detector. The triggering is done by detecting a detached decay vertex a few mm from the primary interaction. To suppress the combinatoric background from charged tracks we chose to use pixel detectors. The size of each pixel is approximately $50\times400\mu m^2$. Simulations of the system have shown that efficiencies on the order of 50% with rejections on the order of a factor of 100 can be obtained.

Hardware development on pixel detectors has been proceeding in conjunction with the Fermilab Radiation Hard Vertex Detection group. The first iteration of an electronics readout chip has been successfully bump-bonded to a pixel sensor and will be tested in beam in the summer of 1999. The second electronics chip is also being produced and we hope to test that one in the beam too. We are also exploring bonding a diamond sensor to the electronics chip for beam testing. Hardware tests are also being planned for the data acquisition system, charged particle tracking using test beams and the muon detector.

We plan to submit a full technical design proposal to the Laboratory in the spring of 2000 and would like to have a detector in C0 with collisions in 2004.

E-898



Schematic drawing of the BooNE spherical tank

E-898 (Conrad / Louis) Booster Neutrino Experiment

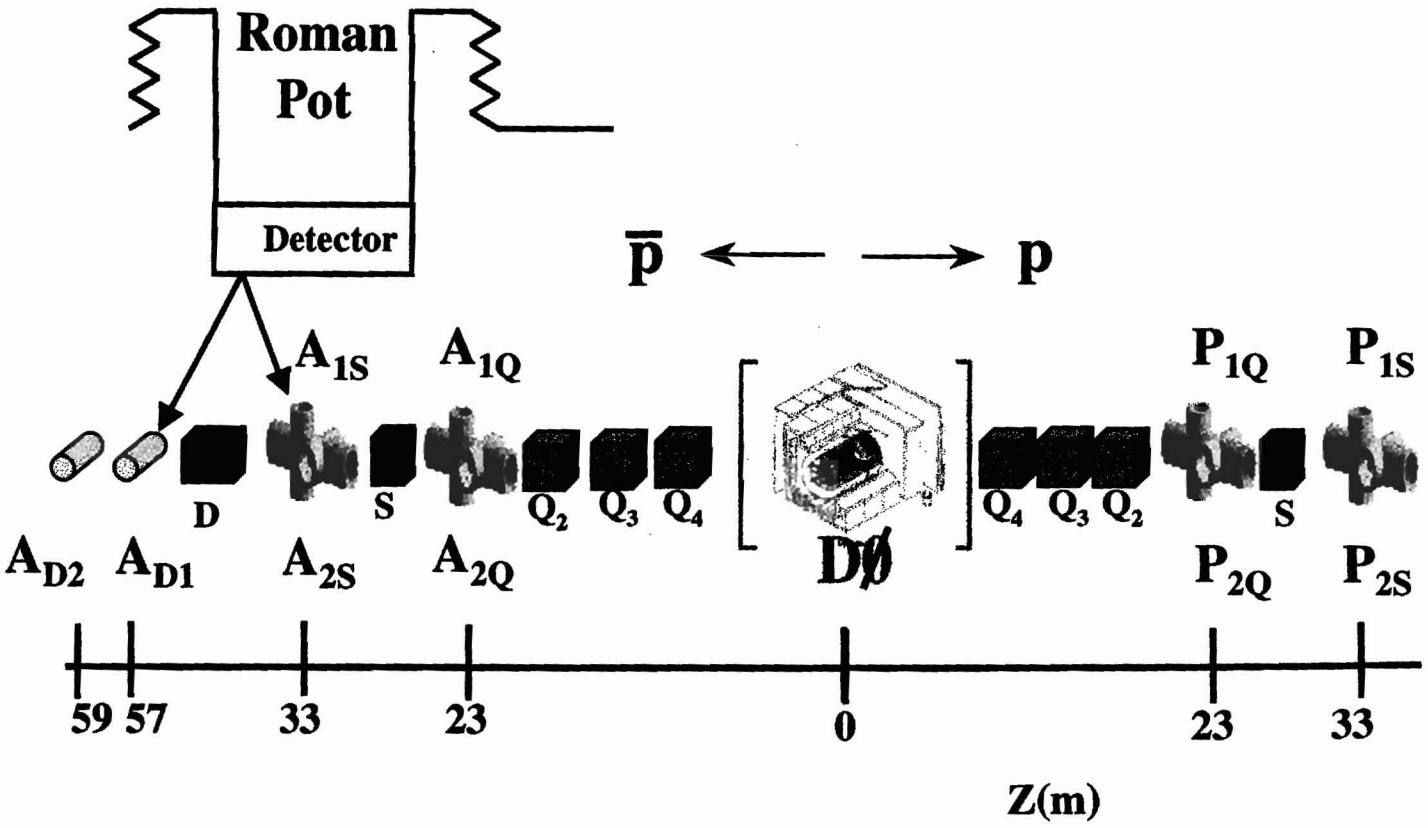
Bucknell, UC/Riverside, Cincinnati, Columbia, Embry Riddle, Fermilab, LANL, Louisiana State, Louisiana Tech, Michigan, Princeton

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 6 m in radius, as shown in the accompanying figure. An inner structure at 5.5 m radius will support 1220 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 220 phototubes mounted on the support structure facing outwards. The detector will be located 500 m from a 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 current schedule calls for data-taking to begin by the end of calendar year 2001.


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

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

Acad. Sci. (Czech Rep.), Amsterdam (Netherlands), los Andes (Colombia), Arizona, BNL, Boston, Brown, Buenos Aires (Argentina), UC/Berkeley, UC/Davis, UC/Irvine, UC/Riverside, CBPF (Brazil), Charles (Czech Rep.), Czech Tech (Czech Rep.), CINVESTAV (Mexico), Columbia, Delhi (India), Fermilab, Florida State, Grenoble (France), IHEP/Beijing (China), IHEP/Protvino (Russia), Illinois/Chicago, Imperial College (England), Indiana, INP/Krakow (Poland), Iowa State, ITEP (Russia), JINR (Russia), Kansas, Kansas State, Korea (Korea), Kyungsung (Korea), Langston, LBNL, Louisiana Tech, Manchester (England), 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), Seoul National (Korea), SUNY/Stony Brook, Tata (India), Texas A&M, Texas/Arlington, 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.

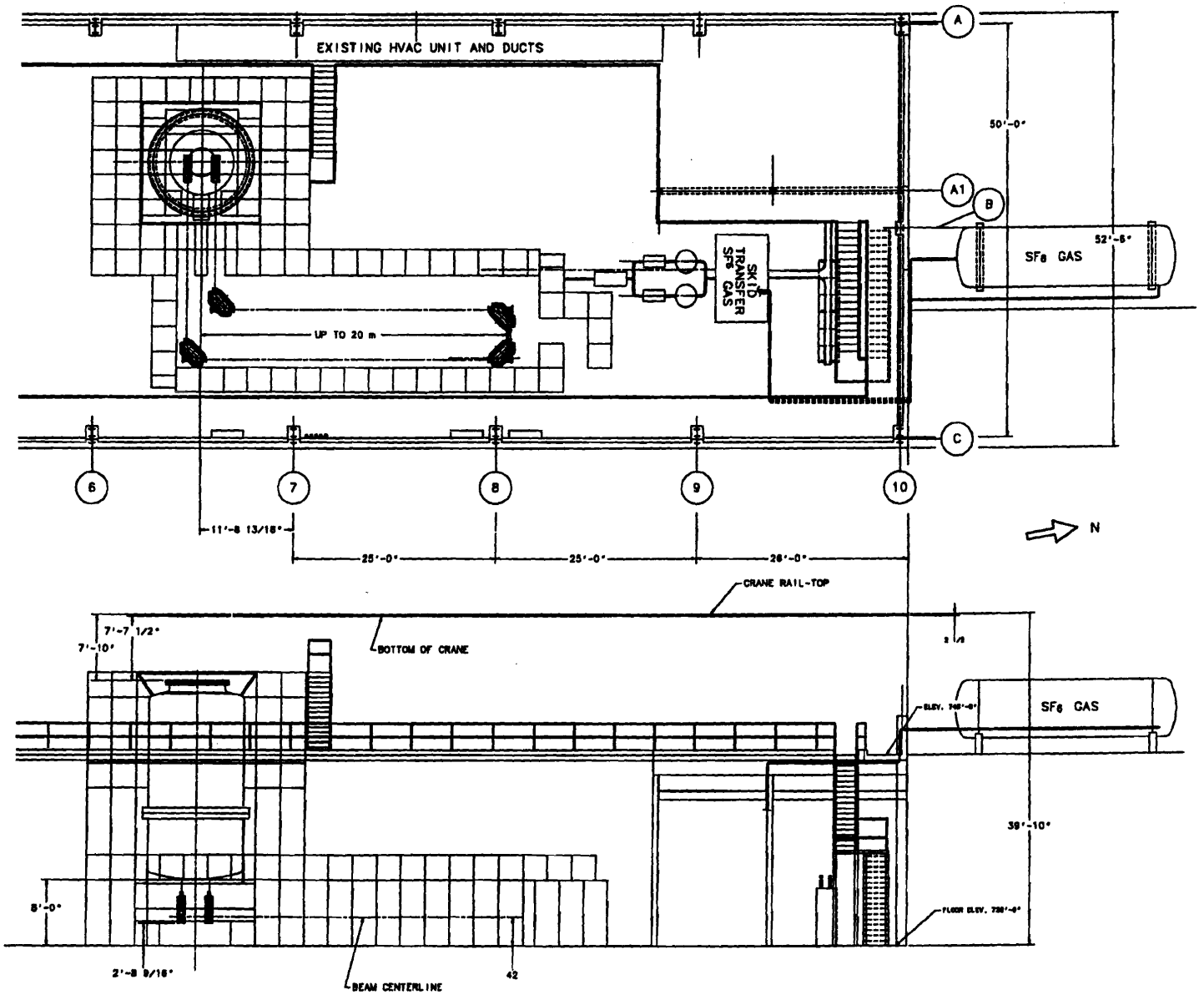
Events with a leading proton comprise about 40% of the total cross section and are typically described by the exchange of a color-singlet pomeron, about which little is known. The addition of the FPD to the D0 detector facilitates studies of the structure of the pomeron and its dependence on diffractive 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


EXISTING HVAC UNIT AND DUCTS
A
A1
B
C
50'-0"
52'-6"
SF6 GAS
SKID TRANSFER SF6 GAS
UP TO 20 m
6
7
8
9
10
11'-8 13/16"
25'-0"
25'-0"
26'-0"
N
CRANE RAIL-TOP
BOTTOM OF CRANE
7'-7 1/2"
7'-10"
SF6 GAS
39'-10"
8'-0"
2'-8 9/16"
BEAM CENTERLINE
42

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

BINP (Russia), Fermilab, Indiana, JINR (Russia)

Status: *No Data Yet*

The purpose of this experiment is to study the technical issues surrounding the implementation of electron cooling in the Recycler. There are two 5 MeV kinetic energy electron accelerators to be constructed and operated to perform this research.

The first is an electrostatic Pelletron to study the effects of solenoidal magnetic field and high beam currents on electrostatic voltage stability. A layout of the Pelletron installation is shown in the accompanying figure. It is approximately 24 ft long and 7 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 second is a modified betatron, a rapid cycling betatron in which a solenoidal field provides stability against space charge beam dynamics effects. The modified betatron is very important for two reasons. First, it is the only accelerator technology option under active consideration that can go to arbitrarily high currents. Second, it can go to much higher energies in a straightforward manner. The modified betatron is a planar racetrack machine which is approximately 5 ft across and 20 ft long.

The plan is to have both accelerators installed and operated in a common 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 2001 is the anticipated date for this transition.

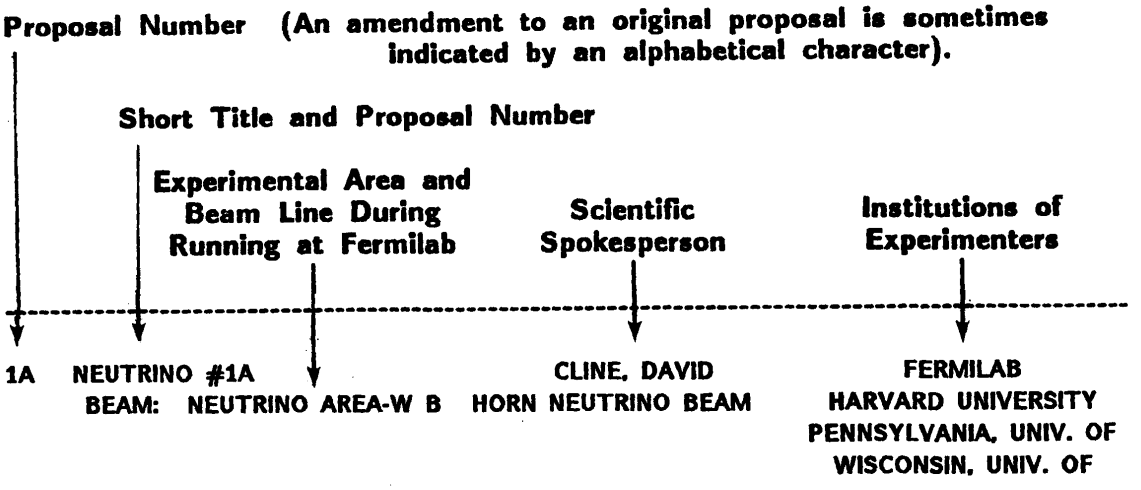
SECTION VII. MASTER LIST OF PROPOSALS

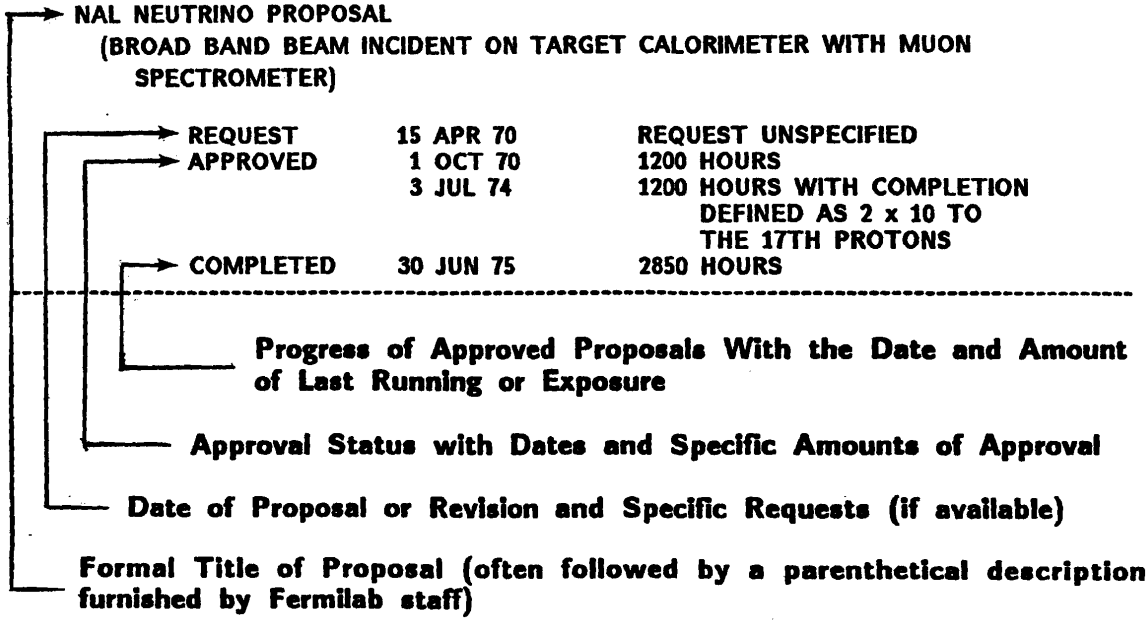
The Master List of proposals contains an entry for each proposal submitted to Fermilab; a typical entry is explained on the next page. In addition to the formal title of the proposal and a brief parenthetical explanation, the name of the spokesperson and a list of participating institutions are included. 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 - 913 ... Total number of approved & pending proposals - 452

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	ANL/Fermilab, MSU, ISU, MD
			100K pix of p - p @ 300 GeV)	
			120K pix of pi minus - p @ 200 GeV	Duke, Toronto, Notre Dame
			50K pix of pi minus - p @ 100 GeV)	
			80K pix of pi plus - p @ 100 GeV	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
ARGONNE NATIONAL LABORATORY
BROOKHAVEN NATIONAL LABORATORY
CARNEGIE-MELLON UNIVERSITY
UNIVERSITY OF CHICAGO
UNIV. OF ILLINOIS, CHICAGO CIRCLE
PURDUE UNIVERSITY
RBL, ORSAY (FRANCE)

BEAM: Meson Area - Miscellaneous
PRELIMINARY SURVEY OF 200 GEV PROTON INTERACTIONS WITH COMPLEX NUCLEI.
(Nuclear chemistry analysis.)

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

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

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
LAL, ORSAY (FRANCE)
UNIVERSITY OF WASHINGTON

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.)

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

BEAM: Proton Area - East
PROPOSAL TO SEARCH FOR HEAVY LEPTONS AND INTERMEDIATE BOSONS FROM PHOTON-NUCLEON AND PHOTON-NUCLEI COLLISIONS.

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
INP, KRAKOW (POLAND)

BEAM: Meson Area - Miscellaneous
CRACOW NUCLEAR EMULSION EXPOSURES.

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
FERMILAB
JOHNS HOPKINS UNIVERSITY

BEAM: Proton Area - West
PROPOSAL FOR EXAMINATION OF WIDE ANGLE GAMMA RAYS AT NAL.
(Single and digamma production by proton-nucleon collisions.)

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

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.)

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

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.)

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
ARGONNE NATIONAL LABORATORY
FERMILAB
SLAC
STANFORD UNIVERSITY

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.)

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
UNIVERSITY OF CHICAGO
PRINCETON UNIVERSITY

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.)

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 BEAM: Meson Area - M6 Beam HADRON SPECTRA FROM HIGH ENERGY INTERACTIONS. (Single particle inclusive spectra from pions, kaons, and protons using single arm spectrometer.)	George W. Brandenburg	UNIVERSITY OF BARI (ITALY) BROWN UNIVERSITY FERMILAB MASSACHUSETTS INST. OF TECHNOLOGY

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 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.)	David B. Cline	UNIVERSITY OF CHICAGO HARVARD UNIVERSITY UNIVERSITY OF WISCONSIN - MADISON

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 BEAM: Neutrino Area - 30 in. Hadron Beam A PROPOSAL TO SEARCH FOR VERY HEAVY STRANGE PARTICLES USING A SMALL HYDROGEN BUBBLE CHAMBER.	Richard L. Lander	UNIV. OF CALIFORNIA, DAVIS LAWRENCE BERKELEY LABORATORY

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 BEAM: Neutrino Area - 30 in. Hadron Beam PROPOSAL TO STUDY PI- P REACTIONS AT 60 AND 200 GEV/C IN THE 30-INCH.	Douglas R. O. Morrison	CERN (SWITZERLAND)

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 BEAM: Neutrino Area - 30 in. Hadron Beam STUDY OF PI- + P INTERACTIONS AT HIGH ENERGY.	Fred Russell Huson	UNIV. OF CALIFORNIA, BERKELEY FERMILAB LAWRENCE BERKELEY LABORATORY

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 BEAM: Neutrino Area - 30 in. Hadron Beam STUDY OF MULTIPARTICLE PRODUCTION IN A 30-INCH BUBBLE CHAMBER.	Jack C. Vander Velde	UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF ROCHESTER

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 BEAM: Neutrino Area - 30 in. Hadron Beam STUDY OF PP INTERACTIONS IN THE ANL 30-INCH HYDROGEN BUBBLE CHAMBER AT NAL.	Thomas H. Fields	ARGONNE NATIONAL LABORATORY FERMILAB IOWA STATE UNIVERSITY UNIVERSITY OF MARYLAND MICHIGAN STATE UNIVERSITY

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 BEAM: Neutrino Area - Miscellaneous PROPOSAL FOR A SEARCH FOR SUPERHEAVY ELEMENTS BY IRRADIATIONS AT NAL.	Raymond W. Stoughton	ARGONNE NATIONAL LABORATORY OAK RIDGE NATIONAL LABORATORY

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 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.	George R. Kalbfleisch	BROOKHAVEN NATIONAL LABORATORY CASE WESTERN RESERVE UNIVERSITY

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 BEAM: Meson Area - Miscellaneous PROPOSAL OF AN EXPERIMENT ON THE FISSION OF VERY HEAVY NUCLEI INDUCED BY 200 GEV PROTONS.	Monique DeBeauvais	CRN, STRASBOURG (FRANCE) UNIVERSITY OF OTTAWA (CANADA)

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 (SERPUKHOV)(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
BEAM: Neutrino Area - 30 in. Hadron Beam
FERMILAB
PROTON-DEUTERON INTERACTIONS IN THE BARE 30-INCH BUBBLE CHAMBER.
UNIVERSITY OF MICHIGAN - ANN ARBOR
SUNY AT STONY BROOK

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)
BEAM: Internal Target Area (C-0)
UNIVERSITY OF ROCHESTER
A PROPOSAL FOR A MAGNETIC RECOIL SPECTROMETER FOR THE GAS JET TARGET.
RUTGERS UNIVERSITY
(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
BEAM: Neutrino Area - Miscellaneous
UNIVERSITY OF PENNSYLVANIA
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
BEAM: Neutrino Area - Miscellaneous
PRINCETON UNIVERSITY
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
BEAM: Neutrino Area - Muon/Hadron Beam
FERMILAB
FEASIBLE SEARCH FOR HEAVY NEUTRAL MUONS PREDICTED BY GAUGE THEORIES AND CONCURRENT
LAWRENCE BERKELEY LABORATORY
MEASUREMENT OF DEEP-INELASTIC VIRTUAL COMPTON SCATTERING.
PRINCETON UNIVERSITY

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)
BEAM: Neutrino Area - Miscellaneous
KOBE UNIVERSITY (JAPAN)
PHENOMENOLOGICAL STUDY OF MUON-NUCLEON COLLISION AT ENERGY MORE THAN 100 GEV IN
OKAYAMA UNIVERSITY (JAPAN)
EMULSION.
OSAKA CITY UNIVERSITY (JAPAN)
OSAKA SCIENCE EDUC. INST. (JAPAN)
UNIVERSITY OF TOKYO (JAPAN)

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

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)
BEAM: Neutrino Area - Miscellaneous
FERMILAB
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
BEAM: Meson Area - M1 Beam
FERMILAB
A MEASUREMENT OF THE PION FORM FACTOR BY DIRECT PION-ELECTRON SCATTERING.
JINR, DUBNA (RUSSIA)
NOTRE DAME UNIVERSITY
UNIVERSITY OF PITTSBURGH

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

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
BEAM: Neutrino Area - 30 in. Hadron Beam
INP, KRAKOW (POLAND)
PION-DEUTERON INTERACTIONS AT 200 GEV/C.
WARSAW UNIVERSITY, INP, (POLAND)
UNIVERSITY OF WASHINGTON

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
BEAM: Neutrino Area - 15 ft. Hadron Beam — LAWRENCE BERKELEY LABORATORY
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
BEAM: Neutrino Area - 15 ft. Hadron Beam — UNIVERSITY OF KANSAS
PROPOSAL TO STUDY NEUTRAL PARTICLE PRODUCTION IN 250 GEV P - P INTERACTIONS IN THE FERMILAB 15-FOOT BUBBLE CHAMBER. — SUNY AT STONY BROOK; TUFTS UNIVERSITY

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)
BEAM: Neutrino Area - 30 in. Hadron Beam — FERMILAB
PROPOSAL TO SURVEY CENTRAL COLLISIONS IN PBAR - P TO MESONS BETWEEN 30 AND 60 GEV/C IN THE 30-INCH BUBBLE CHAMBER AT FERMILAB. — PURDUE UNIVERSITY

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)
BEAM: Neutrino Area - 30 in. Hadron Beam — UNIVERSITY OF STOCKHOLM (SWEDEN)
PROPOSAL TO STUDY MULTIPARTICLE PRODUCTION IN 100 GEV/C ANTI-PROTON-DEUTERIUM INTERACTIONS WITH THE FERMILAB 30-INCH BUBBLE CHAMBER. — VANDERBILT UNIVERSITY

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 PWC 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
BEAM: Meson Area - M2 Beam — CALIFORNIA INSTITUTE OF TECHNOLOGY
A PROPOSAL TO STUDY NEUTRAL PIONS AND MESON INCLUSIVE PRODUCTION WITH INCIDENT NEGATIVE PIONS IN THE TRIPLE REGGE REGION. — LAWRENCE BERKELEY LABORATORY
(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 for exps# 268 and 350
Completed	24 Feb, 77	900 Hours	

356 NEUTRINO #356 — Frank J. Sciulli — CALIFORNIA INSTITUTE OF TECHNOLOGY
BEAM: Neutrino Area - Dichromatic — FERMILAB
STUDIES OF DEEP INELASTIC DIFFERENTIAL DISTRIBUTIONS AT HIGH ENERGIES FOR NEUTRINO AND ANTI-NEUTRINO BEAMS. — UNIVERSITY OF ROCHESTER; ROCKEFELLER UNIVERSITY
(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
BEAM: Meson Area - M2 Beam — UNIVERSITY OF MICHIGAN - ANN ARBOR
A PROPOSAL TO SEARCH FOR CHARMED PARTICLES AND MEASUREMENTS OF TWO-PARTICLE INCLUSIVE CROSS SECTIONS AT LARGE P-TRANSVERSE. — PURDUE UNIVERSITY
(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
BEAM: Internal Target Area (C-0) — FERMILAB
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.) — JINR, DUBNA (RUSSIA); UNIVERSITY OF ROCHESTER

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
BEAM: Neutrino Area - Muon/Hadron Beam — FERMILAB
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.) — INP, KRAKOW (POLAND); MICHIGAN STATE UNIVERSITY; UNIVERSITY OF WASHINGTON

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
BEAM: Meson Area - M4 Beam — UNIV. OF CALIFORNIA, SAN DIEGO
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.) — CARELTON UNIVERSITY (CANADA); MICHIGAN STATE UNIVERSITY

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)
BEAM: Neutrino Area - Miscellaneous — JAMMU UNIVERSITY (INDIA)
PROPOSAL FOR EXPOSURE OF A STACK OF NUCLEAR EMULSIONS TO PROTONS OF 400 GEV/C. — PANJAB UNIVERSITY (INDIA); RAJASTHAN UNIVERSITY (INDIA)

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
BEAM: Neutrino Area - Dichromatic — UNIVERSITY OF HAWAII AT MANOA
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. — LAWRENCE BERKELEY LABORATORY

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
BEAM: Neutrino Area - Wide Band Horn — CARNEGIE-MELLON UNIVERSITY
ANTI-NEUTRINO INTERACTIONS IN THE DEUTERIUM-FILLED 15-FOOT BUBBLE CHAMBER. — PURDUE UNIVERSITY

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
BEAM: Neutrino Area - Muon/Hadron Beam — FERMILAB
EXPLORATION OF RARE MUON-INDUCED PROCESSES. — LAWRENCE BERKELEY LABORATORY; PRINCETON UNIVERSITY

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
BEAM: Meson Area - M2 Beam — UNIVERSITY OF PENNSYLVANIA
CALORIMETER-ARRAY STUDY OF HIGH P-TRANSVERSE EVENTS. — UNIVERSITY OF WISCONSIN - MADISON

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	K 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 — BROOKHAVEN NATIONAL LABORATORY; UNIVERSITY OF MICHIGAN - ANN ARBOR; RUTGERS UNIVERSITY; UNIVERSITY OF WISCONSIN - MADISON
BEAM: Meson Area - M2 Beam
A SEARCH FOR PROTON POLARIZATION IN INCLUSIVE PRODUCTION AT 300 GEV/C.

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 — KOBE UNIVERSITY (JAPAN); KONAN UNIVERSITY (JAPAN); SAITAMA UNIVERSITY (JAPAN); UNIVERSITY OF TOKYO (JAPAN)
BEAM: Neutrino Area - Miscellaneous
CASCADE SHOWERS ORIGINATED IN JET SHOWERS DUE TO NEGATIVE PIONS.

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 — 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)
BEAM: Meson Area - M1 Beam
PROPOSAL TO STUDY CHANNELING AT FERMILAB.
(Using the spectrometer of exp #456.)

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 — INP, KRAKOW (POLAND)
BEAM: Meson Area - Test Beam
STUDY OF THE MECHANISM FOR MULTIPLE PRODUCTION OF PARTICLES AT HIGH ENERGIES.

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 — KANAGAWA UNIVERSITY (JAPAN); KOBE UNIVERSITY (JAPAN); UNIVERSITY OF TOKYO (JAPAN)
BEAM: Neutrino Area - Miscellaneous
SEARCH FOR THE LARGE ANGLE SCATTERING OF MUONS.

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 — AICHI UNIV. OF EDUCATION (JAPAN); NAGOYA UNIVERSITY (JAPAN); YOKOHAMA NATIONAL UNIV. (JAPAN)
BEAM: Proton Area - Miscellaneous
STUDY OF CASCADE SHOWERS INITIATED BY ELECTRONS.

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 — CARNEGIE-MELLON UNIVERSITY; FERMILAB; NORTHWESTERN UNIVERSITY; NOTRE DAME UNIVERSITY
BEAM: Meson Area - M1 Beam
PROPOSAL TO STUDY CHARGED PARTICLES PRODUCED IN HADRONIC INTERACTIONS.

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 — 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)
BEAM: Proton Area - East
A STUDY OF PHOTOPRODUCTION USING A MAGNETIC SPECTROMETER AT THE TAGGED PHOTON LAB.

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 — INDIANA UNIVERSITY
BEAM: Internal Target Area (C-0)
A STUDY OF INCLUSIVE PROTON POLARIZATION.

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 — UNIVERSITY OF WASHINGTON
BEAM: Meson Area - Test Beam
PROPOSAL TO STUDY INTERACTIONS OF PROTONS OF ENERGY GREATER THAN 500 GEV IN EMULSION AND HEAVY NUCLEI.

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 — UNIVERSITY OF WASHINGTON
BEAM: Neutrino Area - Miscellaneous
PROPOSAL TO STUDY PROTON-NUCLEUS INTERACTIONS IN EMULSION PLATES WITH EMBEDDED METAL POWDER GRANULES AT 300 GEV.

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
BEAM: Proton Area - West — CEN-SACLAY (FRANCE)
SEARCH FOR CHARM PRODUCTION IN 200 GEV/C HADRON INTERACTIONS. — FERMILAB
(Using the spectrometer for exp #302 with additions.) — PRINCETON UNIVERSITY
UNIVERSITY OF TORINO (ITALY)

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)
BEAM: Neutrino Area - Miscellaneous — CRN, STRASBOURG (FRANCE)
300 GEV PION INTERACTIONS IN NUCLEAR EMULSION. — 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)

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
BEAM: Neutrino Area - 30 in. Hadron Beam — FERMILAB
PROPOSAL FOR A STUDY OF PARTICLE PRODUCTION AND DYNAMICS FROM X ≈ 0 TO X ≈ 1 AND THE DEPENDENCE ON INCIDENT QUANTUM NUMBERS. — COLLEGE DE FRANCE (FRANCE)
(Supercedes proposal #488. Will use the forward gamma detector and the downstream ISIS system with the 30-inch hybrid spectrometer.) — 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

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)
BEAM: Neutrino Area - Miscellaneous — NAGOYA UNIVERSITY (JAPAN)
A SEARCH FOR CHARMED PARTICLES PRODUCED BY 300 GEV/C NEGATIVE PIONS IN NUCLEAR EMULSION. — YOKOHAMA NATIONAL UNIV. (JAPAN)

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)
BEAM: Neutrino Area - Miscellaneous — CRN, STRASBOURG (FRANCE)
500 GEV PROTON INTERACTIONS IN NUCLEAR EMULSION — 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)

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
BEAM: Meson Area - M6 Beam — UNIV. OF CALIFORNIA, SAN DIEGO
PROPOSAL TO MEASURE PI P ELASTIC SCATTERING AT LARGE ANGLES. — CORNELL UNIVERSITY
FERMILAB

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. There is no approval yet for any experiment to use the beam.
Approved/Inactive	10 Feb, 84	Unspecified	

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
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.

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

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
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.

FERMILAB
VIRGINIA TECH

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
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.

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)

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
BEAM: Neutrino Area - Prompt Beam
SEARCH FOR THE TAU NEUTRINO AND STUDY OF ELECTRON NEUTRINO AND ELECTRON ANTI-NEUTRINO INTERACTIONS.

UNIV. OF CALIFORNIA, BERKELEY
FERMILAB
UNIVERSITY OF HAWAII AT MANOA
ILLINOIS INSTITUTE OF TECHNOLOGY
RUTGERS UNIVERSITY
STEVENS INSTITUTE OF TECHNOLOGY
TUFTS UNIVERSITY

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
BEAM: Proton Area - West
REQUEST FOR A CONTINUATION OF E-567.

BROOKHAVEN NATIONAL LABORATORY
CEN-SACLAY (FRANCE)
PRINCETON UNIVERSITY
TEXAS A&M UNIVERSITY
UNIVERSITY OF TORINO (ITALY)

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
BEAM: Neutrino Area - East
A PROPOSAL TO MEASURE CHARM AND B DECAYS VIA HADRONIC PRODUCTION IN A HYBRID EMULSION SPECTROMETER.

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)

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
BEAM: Meson Area - M4 Beam
PROPOSAL TO STUDY THE EFFECT OF BENT CRYSTALS ON CHANNELING NEAR THE CRITICAL RADIUS OF BENDING.

CERN (SWITZERLAND)
CHALK RIVER NUCLEAR LAB. (CANADA)
FERMILAB
JINR, DUBNA (RUSSIA)
UNIVERSITY OF NEW MEXICO
SUNY AT ALBANY
UNIVERSITY OF STRASBOURG (FRANCE)

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
BEAM: Meson Area - M4 Beam
COMPARISON OF POLARIZATION OF INCLUSIVELY PRODUCED LAMBDAS AND ANTILAMBDAS BY PROTONS, ANTIPROTONS, KAONS AND PIONS ON HYDROGEN.
UNIV. OF CALIFORNIA, DAVIS
UNIV. OF CALIFORNIA, SAN DIEGO
CARELTON UNIVERSITY (CANADA)
FERMILAB
MICHIGAN STATE UNIVERSITY

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
BEAM: Neutrino Area - Muon Beam
MUON SCATTERING WITH HADRON DETECTION AT THE TEVATRON.
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

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
BEAM: Proton Area - Center
EMULSION EXPOSURE TO SIGMA MINUS BEAM AT FERMILAB.
INP, KRAKOW (POLAND)
UNIVERSITY OF WASHINGTON

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
BEAM: Proton Area - East
STUDY OF PION-NUCLEUS INTERACTIONS IN PURE EMULSION STACKS AND EMULSION CHAMBERS AT ENERGY ABOVE 500 GEV.
INP, KRAKOW (POLAND)
LEBEDEV PHYSICAL INST. (RUSSIA)
LOUISIANA STATE UNIVERSITY
TASHKENT, PHY.TEC.INS (UZBEKISTAN)

Request	2 Dec, 80	Emulsion Exposure
Approval	28 Mar, 90	Unspecified
Completed	27 Aug, 90	Unspecified

668 EMULSION/PI- @ 800 #668 — Wladyslaw Wolter
BEAM: Unspecified Beam
STUDY OF PION NUCLEUS INTERACTIONS IN PURE EMULSION STACKS AND EMULSION CHAMBERS AT ENERGY ABOVE 800 GEV.
INP, KRAKOW (POLAND)

Request	2 Dec, 80	Emulsion Exposure
Completed	26 Apr, 85	Emulsion Exposure

672A HADRON JETS #672A — Andrzej Zieminski
BEAM: Meson Area - West
A STUDY OF HADRONIC FINAL STATES PRODUCED IN ASSOCIATION WITH HIGH-PT JETS AND HIGH-MASS DIMUONS.
FERMILAB
UNIV. OF ILLINOIS, CHICAGO CIRCLE
INDIANA UNIVERSITY
UNIVERSITY OF LOUISVILLE
UNIVERSITY OF MICHIGAN - FLINT
IHEP, PROTVINO (SERPUKHOV)(RUSSIA)

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
BEAM: Neutrino Area - Muon/Hadron Beam
CHI MESON PRODUCTION BY HADRONS.
(E-610 extension.)
FERMILAB
UNIVERSITY OF ILLINOIS, CHAMPAIGN
UNIVERSITY OF PENNSYLVANIA
PURDUE UNIVERSITY
TUFTS UNIVERSITY

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
BEAM: Proton Area - Broad Band
PHOTOPRODUCTION OF HIGH PT JETS.
BALL STATE UNIVERSITY
FERMILAB
UNIVERSITY OF IOWA
UNIVERSITY OF MARYLAND
UNIVERSITY OF MICHIGAN - ANN ARBOR
RICE UNIVERSITY
VANDERBILT UNIVERSITY

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
BEAM: Proton Area - Broad Band
HIGH ENERGY PHOTOPRODUCTION OF STATES CONTAINING HEAVY QUARKS AND OTHER RARE PHENOMENA.
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

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	COLUMBIA UNIVERSITY FERMILAB UNIVERSITY OF GUANAJUATO (MEXICO) UNIVERSITY OF MASSACHUSETTS TEXAS A&M UNIVERSITY
	BEAM: Neutrino Area - East STUDY OF HADRONIC PRODUCTION AND SPECTROSCOPY OF STRANGE, CHARM AND BOTTOM PARTICLES AT THE TEVATRON.		

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	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)
	BEAM: Proton Area - East PROPOSAL TO DO PHOTON PHYSICS WITH THE TEVATRON AT THE TAGGED PHOTON SPECTROMETER.		

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	UNIVERSITY OF BARI (ITALY) ECOLE POLYTECH, PALAISEAU (FRANCE) ILLINOIS INSTITUTE OF TECHNOLOGY LONDON UNIVERSITY COLLEGE(ENGLAND) TUFTS UNIVERSITY
	BEAM: Neutrino Area - Prompt Beam STUDY OF NEUTRINO OSCILLATIONS AND SEARCH FOR THE TAU NEUTRINO.		

Request	10 Feb, 81	2.5 E18th Protons
Inactive	1 Apr, 84	

701	NEUTRINO OSCILLATION #701	Michael H. Shaevitz	UNIVERSITY OF CHICAGO COLUMBIA UNIVERSITY FERMILAB UNIVERSITY OF ROCHESTER
	BEAM: Neutrino Area - Dichromatic A SEARCH FOR NEUTRINO OSCILLATIONS WITH DELTA-M-SQUARE GREATER THAN 10 EV-SQUARE.		

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	IHEP, BEIJING (PRC) FERMILAB NORTHEASTERN UNIVERSITY TEXAS A&M UNIVERSITY
	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.)		

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	CIPP (CANADA) CARELTON UNIVERSITY (CANADA) CEN-SACLAY (FRANCE) CHALK RIVER NUCLEAR LAB. (CANADA) CORNELL UNIVERSITY ENRICO FERMI INSTITUTE FERMILAB UNIVERSITY OF MARYLAND MCGILL UNIVERSITY (CANADA) NATIONAL RESEARCH COUNCIL (CANADA) UNIVERSITY OF SASKATCHEWAN(CANADA) UNIVERSITY OF TORONTO (CANADA) TRIUMF (CANADA) YORK UNIVERSITY (CANADA)
	BEAM: Collision Area (D-0) ELECTRON-PROTON COLLISIONS AT FERMILAB (Electron-proton collisions using the canadian high energy electron ring cheer.)		

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	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 INTEGRATED PROPOSAL ON FIRST ROUND EXPERIMENTS WITH THE POLARIZED BEAM FACILITY.		

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 BEAM: Proton Area - Center PRECISION MEASUREMENT OF THE DECAY SIGMA MINUS TO NEUTRON AND ELECTRON AND NEUTRINO.	Peter S. Cooper	UNIVERSITY OF CHICAGO ELMHURST COLLEGE FERMILAB IOWA STATE UNIVERSITY UNIVERSITY OF IOWA PNPI, ST. PETERSBURG (RUSSIA) YALE UNIVERSITY
	Request 19 Feb, 82 Unspecified Approval 23 Jun, 82 Unspecified for 3 months Completed 14 Feb, 84 820 Hours		
716	BEAM DUMP #716 BEAM: Meson Area - M2 Beam PROPOSAL FOR FURTHER BEAM DUMP NEUTRINO RUNNING	Byron P. Roe	FERMILAB UNIVERSITY OF FIRENZE (ITALY) UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF WISCONSIN - MADISON
	Request 9 Feb, 82 Unspecified Rejected 23 Jun, 82		
717	FORWARD DETECTOR #717 BEAM: Collision Area (D-0) A FORWARD LOOKING DETECTOR FOR THE D0 AREA.	Joseph Lach	FERMILAB
	Request 19 Mar, 82 Unspecified Rejected 23 Jun, 82		
718	CALORIMETERS AT D-0 #718 BEAM: Collision Area (D-0) STUDY OF PBAR-P INTERACTIONS USING CALORIMETERS AT D-0.	Albert R. Erwin	ARGONNE NATIONAL LABORATORY UNIVERSITY OF ARIZONA FERMILAB UNIVERSITY OF PENNSYLVANIA UNIVERSITY OF WISCONSIN - MADISON
	Request 1 Apr, 82 Unspecified Rejected 23 Jun, 82		
719	ELECTRON TARGET FACILITY #719 BEAM: Collision Area (D-0) ELECTRON-PROTON INTERACTION EXPERIMENT. (This proposal supercedes proposals #703 and #708.)	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)
	Request 14 May, 82 Unspecified Not Approved 23 Jun, 82		
720	FREE QUARK SEARCH #720 BEAM: Miscellaneous Area PROPOSAL TO SEARCH FOR +1/3E STABLE PARTICLES USING CRYOGENIC SOURCES.	John P. Schiffer	ARGONNE NATIONAL LABORATORY FERMILAB
	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 BEAM: Proton Area - West AN EXPERIMENT TO STUDY CP VIOLATION IN THE DECAY OF K-LONG PRODUCED BY ANTI-PROTONS.	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)
	Request 11 Jun, 82 Unspecified Approval 12 Mar, 84 Test Running Approved/Inactive 30 Jun, 87 Unspecified		
722	D-0 STREAMER CHAMBER #722 BEAM: Collision Area (D-0) STREAMER CHAMBER EXPERIMENT AT THE TEVATRON COLLIDER.	V. Paul Kenney	UNIVERSITY OF CAMBRIDGE (ENGLAND) NOTRE DAME UNIVERSITY
	Request 11 Oct, 82 Unspecified Inactive 18 Feb, 83		
723	GRAVITATIONAL DETECTOR #723 BEAM: Collision Area (C-0) TEST OF A GRAVITATIONAL DETECTOR AT THE TEVATRON COLLIDER.	Adrian Melissinos	FERMILAB UNIVERSITY OF ROCHESTER
	Request 21 Oct, 82 Unspecified Approval 12 Mar, 84 Test Running Completed 29 Aug, 85 Test Running		
724	CALORIMETRIC DETECTOR #724 BEAM: Collision Area (D-0) COMPLETE CALORIMETRIC DETECTOR FOR THE D-0 AREA.	Michael J. Longo	CALIFORNIA INSTITUTE OF TECHNOLOGY UNIV. OF ILLINOIS, CHICAGO CIRCLE MCGILL UNIVERSITY (CANADA) UNIVERSITY OF MICHIGAN - ANN ARBOR NOTRE DAME UNIVERSITY
	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)
	BEAM: Proton Area - East			FERMILAB
	MEASUREMENTS OF CRYSTAL-ASSISTED ELECTRON-POSITRON PAIR CREATION.			LAPP, D'ANNECY-LE-VIEUX (FRANCE)
				SUNY AT ALBANY
	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)
	BEAM: Collision Area (D-0)			UNIVERSITY OF ARIZONA
	STUDY OF PROTON ANTI-PROTON COLLISIONS USING A LARGE DETECTOR AT D-0.			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
	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
	BEAM: Collision Area (B-0)			BRANDEIS UNIVERSITY
	STUDY OF PROTON ANTI-PROTON COLLISIONS USING A LARGE DETECTOR AT B-0.			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
	Request	1 Apr, 82	Unspecified	
	Approval	1 Apr, 82	Unspecified	
	Completed	31 May, 89	Unspecified	
742	STRANGE QUARK #742	Joseph Lach		UNIVERSITY OF CHICAGO
	BEAM: Proton Area - Center			ELMHURST COLLEGE
	LETTER OF INTENT TO MEASURE OMEGA MINUS POLARIZATION AND MAGNETIC MOMENT.			FERMILAB
				IOWA STATE UNIVERSITY
				UNIVERSITY OF IOWA
				PNPI, ST. PETERSBURG (RUSSIA)
				YALE UNIVERSITY
	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 BEAM: Meson Area - Center MEASUREMENT OF PHASE DIFFERENCE BETWEEN ETA 00 AND ETA +- TO A PRECISION OF 1/2 DEGREE.		UNIVERSITY OF CHICAGO ELMHURST COLLEGE FERMILAB UNIVERSITY OF ILLINOIS, CHAMPAIGN RUTGERS UNIVERSITY
	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 BEAM: Proton Area - Broad Band ELECTRON BEAM DUMP PARTICLE SEARCH IN THE WIDE BAND HALL.		FERMILAB UNIVERSITY OF ILLINOIS, CHAMPAIGN INP, KRAKOW (POLAND) NORTHEASTERN UNIVERSITY
	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 BEAM: Collision Area (B-0) CDF UPGRADE (Level-3 Trigger; Silicon Vertex (#775A); and Muon System (#775B))		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
	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 BEAM: Miscellaneous Area MEASUREMENT OF NUCLEAR CALIBRATION CROSS SECTIONS FOR PROTONS GREATER THAN 400 GEV.		BROOKHAVEN NATIONAL LABORATORY CERN (SWITZERLAND) FERMILAB
	Request	6 Aug, 86 Unspecified	
	Approval	7 Jan, 87 Unspecified	
	Completed	15 Feb, 88 Unspecified	
777	MR TUNNEL NEUTRONS #777 Joseph B. McCaslin BEAM: Collision Area (Miscellaneous) NEUTRON FLUX MEASUREMENTS IN THE TEVATRON TUNNEL.		FERMILAB LAWRENCE BERKELEY LABORATORY SSC CENTRAL DESIGN GROUP
	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 BEAM: Collision Area (Miscellaneous) STUDY OF THE SSC MAGNET APERTURE CRITERION.		CERN (SWITZERLAND) CORNELL UNIVERSITY FERMILAB UNIVERSITY OF HOUSTON SSC CENTRAL DESIGN GROUP SLAC
	Request	18 Oct, 86 Unspecified	
	Approval	10 Dec, 86 Unspecified	
	Completed	21 Jan, 91 Unspecified	
779	HIGH RATE CALORIMETER STUDY#779 David F. Anderson BEAM: Meson Area - West PROPOSAL TO BUILD A VERY HIGH RATE CALORIMETER.		FERMILAB
	Request	29 Oct, 86 Unspecified	
	Rejected	10 Dec, 86	
780	CHARM PRODUCTION BY PROTONS#780 Ronald J. Lipton and Douglas M. Potter BEAM: Neutrino Area - East STUDY OF CHARM PRODUCED BY 850 GEV PROTONS.		UNIV. OF CALIFORNIA, DAVIS CARNEGIE-MELLON UNIVERSITY UNIVERSITY OF OKLAHOMA
	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 BEAM: Neutrino Area - Center NEUTRINO OSCILLATIONS AND CROSS-SECTIONS IN A TAGGED NEUTRINO LINE. Request 11 Aug, 87 Unspecified Inactive 23 Dec, 92	Robert H. Bernstein	FERMILAB UNIV. OF PARIS VI, LPG (FRANCE)
789	B-QUARK MESONS & BARYONS #789 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	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
790	CALORIMETER FOR ZEUS #790 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	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
791	HADROPRODUCTION HEAVY FLAVORS #791 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	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
792	NUCLEAR FRAGMENTS #792 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	Kjell Aleklett and Lembit Sihver	LAL, ORSAY (FRANCE) UPPSALA UNIVERSITY (SWEDEN)
793	EMULSION EXPOSURE 1000 GeV #793 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	Jere J. Lord	KAZAKH STATE UNIV., (KAZAKHSTAN) WASHINGTON NATURAL PHILOSOPHY INS. UNIVERSITY OF WASHINGTON
794	AXION HELIOSCOPE #794 BEAM: Unspecified Beam CONSTRUCTION AND OPERATION OF AN AXION HELIOSCOPE. Request 5 Mar, 88 Unspecified Inactive 23 Dec, 92	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
795	WARM LIQUID CALORIMETRY TEST #795 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	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
796	CP VIOLATION #796 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	Gordon B. Thomson	UNIVERSITY OF MINNESOTA RUTGERS UNIVERSITY
797	FINE-GRAINED ELECTROMAG. CAL. #T797 BEAM: Proton Area - East FINE-GRAINED ELECTROMAGNETIC CALORIMETRY. Request 31 Aug, 88 Unspecified Approval 1 Apr, 90 Unspecified Completed 20 May, 90 Unspecified	H. Richard Gustafson and Rudolf P. Thun	UNIVERSITY OF MICHIGAN - ANN ARBOR

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 — Katsushi Arisaka and Robert S. Tschirhart — UNIVERSITY OF ARIZONA; UNIV. OF CALIFORNIA, LOS ANGELES; UNIV. OF CALIFORNIA, SAN DIEGO; UNIVERSITY OF CHICAGO; UNIVERSITY OF COLORADO AT BOULDER; ELMHURST COLLEGE; FERMILAB; OSAKA UNIVERSITY (JAPAN); RICE UNIVERSITY; RUTGERS UNIVERSITY; 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		

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 KAON PHYSICS AT MAIN INJECTOR #804 — Ronald Ray — UNIV. OF CALIFORNIA, IRVINE; CEN-SACLAY (FRANCE); UNIVERSITY OF CHICAGO; FERMILAB; UNIVERSITY OF ILLINOIS, CHAMPAIGN; RUTGERS UNIVERSITY; YALE UNIVERSITY
BEAM: Main Injector Area
HIGH PRECISION, HIGH SENSITIVITY KAON PHYSICS AT THE MAIN INJECTOR

Request	14 Jun, 88	Unspecified	
Unconsidered	14 Jun, 88		

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	

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 Permilab			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 BEAM: Collision Area (D-0) D0 Detector Upgrade	Hugh Elliott Montgomery and Hendrick J. Weerts	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 UNIV. OF CALIFORNIA, DAVIS UNIV. OF CALIFORNIA, IRVINE UNIV. OF CALIFORNIA, RIVERSIDE CBPF (BRAZIL) CEN-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 KOREA UNIVERSITY, SEOUL (KOREA) INP, KRAKOW (POLAND) KYUNGSUNG UNIVERSITY, PUSAN(KOREA) LAL, ORSAY (FRANCE) 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) NORTHEASTERN UNIVERSITY NORTHERN ILLINOIS UNIVERSITY NORTHWESTERN UNIVERSITY NOTRE DAME UNIVERSITY UNIVERSITY OF OKLAHOMA PANJAB UNIVERSITY (INDIA) 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) SEOUL NATIONAL UNIVERSITY (KOREA) TATA INSTITUTE (INDIA) TEXAS A&M UNIVERSITY UNIVERSITY OF TEXAS AT ARLINGTON 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 BEAM: Main Injector Area Neutrino Beam from the Proposed Main Injector to the DUMAND Detector	Medford S. Webster	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	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)
	BEAM: Unspecified Beam		
	Testing of Prototype Detectors for the Solenoidal Detector Collaboration		

Request	1 Oct, 90 Unspecified
Inactive	23 Dec, 92

826	HYPERON MEASUREMENTS #826	Kenneth A. Johns and Regina A. Rameika	UNIVERSITY OF ARIZONA FERMILAB UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF MINNESOTA
	BEAM: Proton Area - Center		
	An Expression of Interest to Continue Hyperon Measurements at Fermilab		

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, 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)
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
UNIVERSITY COLLEGE LONDON(ENGLAND)
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 BEAM: Proton Area - Broad Band A High Statistics Study of States Containing Heavy Quarks Using the Wideband Photon Beam and the E687 Multiparticle Spectrometer	John P. Cumalat and Luigi Moroni	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 BEAM: Neutrino Area - Muon Beam Proposal for a New Tevatron Search for Direct CP Violation in the 2pi decays of the Neutral Kaon	Edward C. Blucher	UNIVERSITY OF ARIZONA UNIV. OF CALIFORNIA, LOS ANGELES UNIV. OF CALIFORNIA, SAN DIEGO UNIVERSITY OF CHICAGO UNIVERSITY OF COLORADO AT BOULDER ELMHURST COLLEGE FERMILAB OSAKA UNIVERSITY (JAPAN) RICE UNIVERSITY RUTGERS UNIVERSITY UNIVERSITY OF VIRGINIA UNIVERSITY OF WISCONSIN - MADISON

Request	18 Oct, 90	Unspecified
In Progress	26 Oct, 96	

833	K-SHORT DECAYS #833 BEAM: Meson Area - Center Letter of Intent to Measure the Branching Ratio for the K-short Decay	Gordon B. Thomson	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 BEAM: Meson Area - West Direct Photon Production #834	Paul F. Slattery	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 BEAM: Accumulator Ring Study of Charmonium States formed in Antiproton-proton Annihilations MOU Executed.	Rosanna Cester and Stephen H. Pordes	UNIV. OF CALIFORNIA, IRVINE FERMILAB UNIVERSITY OF FERRARA (ITALY) INFN, GENOVA (ITALY) NORTHWESTERN UNIVERSITY UNIVERSITY OF TORINO (ITALY)

Request	16 Oct, 90	Unspecified	
Approval	7 Dec, 92	Unspecified	
In Progress	1 Oct, 96		

836	SUPERCONDUCTING DETECTOR TEST #836 BEAM: Unspecified Beam Proposal for a Beam Test of a Superconducting Thin Film Strip Particle Detector	Robert G. Wagner	ARGONNE NATIONAL LABORATORY

Request	3 Oct, 90	24 Hours in three 8 hour shifts	
Withdrawn	8 Jan, 92		

837	EMPACT/TEXAS TEST #837 BEAM: Unspecified Beam EMPACT/TEXAS Beam Test(s)	Michael D. Marx	SUNY AT STONY BROOK

Request	12 Oct, 90	Unspecified	
Inactive	23 Dec, 92		

838	POLARIZED BEAM #838 BEAM: Meson Area - Polarized Proton Beam Continuation of E-704 and Simultaneous Measurement of Chi-2 Production	Akihiko Yokosawa	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	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)

BEAM: Neutrino Area - Muon Beam
Scintillating Fiber Tracker - Beam Test

Request	25 Sep, 90	Unspecified	
Approval	15 Apr, 91	Unspecified	
Completed	8 Jan, 92	Unspecified	

840	SPAGHETTI CALORIMETRY TEST #840	Adam Para	FERMILAB

BEAM: Meson Area - Polarized Proton Beam
Spaghetti calorimetry in '91 test beam cycle

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	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

BEAM: Meson Area - Test Beam
Proposal for Beam Test of Scintillator Calorimeter Prototypes at Fermilab during FY 1991

Request	8 Oct, 90	Unspecified	
Approval	28 Mar, 91	Unspecified	
Completed	8 Jan, 92	Unspecified	

842	RADIATION EXPOSURE #842	David G. Underwood	ARGONNE NATIONAL LABORATORY

BEAM: Proton Area - Broad Band
Proposed Radiation Measurement in the Wideband Neutral Dump Area

Request	6 Nov, 90	Unspecified	
Approval	15 Aug, 91	Unspecified	
Completed	8 Jan, 92	Unspecified	

843	EMULSION EXPOSURE 600 GeV #843	C. O. Kim	CHONNAM NATIONAL UNIVERSITY(KOREA) KOREA UNIVERSITY, SEOUL (KOREA)

BEAM: Neutrino Area - Muon Beam
Interactions of 600 Gev Muons with Emulsion Nuclei

Request	24 Oct, 90	Unspecified	
Approval	1 Jul, 91	Unspecified	
Completed	13 Jul, 91	Unspecified	

844	TRD/SHOWER COUNTER TEST #844	Simon P. Swordy	ENRICO FERMI INSTITUTE

BEAM: Meson Area - Polarized Proton Beam
Transition Radiation Detector/EM Shower Counter Calibration

Request	28 Nov, 90	40 Hours	
Approval	11 Oct, 91	Unspecified	
Completed	26 Dec, 91	Unspecified	

845	TEVATRON BEAUTY #845	Peter E. Schlein	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

BEAM: Unspecified Beam
A Dedicated Beauty Experiment for the Tevatron Collider

Request	7 Jan, 91	Unspecified
Rejected	10 Jul, 91	

846	FRACTIONAL CHARGE IMPURITIES #846	Unil Perera	UNIVERSITY OF PITTSBURGH

BEAM: Meson Area - West
Search for Fractional Charge Impurities

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 BEAM: Neutrino Area - Test Beam Request for Test Beam Time for Barium Fluoride Calorimeter Development	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)
	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 BEAM: Meson Area - Test Beam Fermilab Test Beam Time of Diamond Radiation Detectors	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
	Request	1 May, 91	Unspecified	
	Approval	8 Jan, 92	Unspecified	
	Withdrawn	8 Jan, 92	Unspecified	
851	FIBER IRRADIATION STUDIES #851 BEAM: Collision Area (C-0) Fiber Irradiation Studies in the C0 Region	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)
	Request	1 May, 91	Unspecified	
	Approval	14 Aug, 91	Unspecified	
	Completed	8 Jan, 92	Unspecified	
852	PIXEL DETECTOR TEST #T852 BEAM: Neutrino Area - Muon Beam Pixel Detector Test at NM	Eric Arens		FERMILAB LAWRENCE BERKELEY LABORATORY
	Request	8 May, 91	Unspecified	
	Approval	9 Sep, 91	Unspecified	
	Completed	23 Dec, 91	Unspecified	
853	TEVATRON CRYSTAL EXTRACTION #853 BEAM: Collision Area (C-0) A Test of Low Intensity Extraction from the Tevatron Using Channeling in a Bent Crystal	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
	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		
854	MUON FLUXES IN THE DEBUNCHER #854 BEAM: Debuncher Ring Proposal to Measure the Flux of Ciculating Muons in the Debuncher.	Alan D. Bross		COLUMBIA UNIVERSITY FERMILAB
	Request	11 Jul, 91	Unspecified	
	Approval	8 Jan, 92	Unspecified	
	Completed	8 Jan, 92	Unspecified	
855	dE/dx MUONS #855 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	George R. Kalbfleisch		UNIVERSITY OF OKLAHOMA SSC LABORATORY
	Request	3 Aug, 91	Unspecified	
	Approval	18 Nov, 91	Unspecified	
	Completed	8 Jan, 92	Unspecified	
856	INTEGRATED PIXEL DETECTOR TEST#856 BEAM: Neutrino Area - Muon Beam An Integrated Pixel Detector - Test Beam Request	Sherwood I. Parker		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 BEAM: Unspecified Beam Proposal to measure all components of the depolarization tensor.	L. I. Sarycheva		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	
	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	
	In Progress	10 Nov, 96	
	Data Analysis	18 Sep, 97	
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 BEAM: Meson Area - East Measurement of x distribution of the ratio of anti(u-quark) to anti(d-quark) in the proton		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	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 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	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)
	Request 3 Sep, 92 Unspecified Rejected 28 Feb, 94		
868	ANTIPROTON DECAY #868 BEAM: Accumulator Ring Proposal to Search for Antiproton Decay at the Fermilab Antiproton Accumulator	Steve Geer	UNIV. OF CALIFORNIA, LOS ANGELES FERMILAB UNIVERSITY OF MICHIGAN - ANN ARBOR UNIVERSITY OF NEBRASKA PENNSYLVANIA STATE UNIVERSITY
	Request 24 Sep, 92 Unspecified Data Analysis 24 Jul, 95		
869	GEM DETECTOR AT THE SSC #869 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	Barry C. Barish and William J. Willis	FERMILAB SSC LABORATORY
	Request 11 Nov, 92 Unspecified Withdrawn 4 Jan, 94		
870	PROTOTYPE DETECTORS FOR THE SDC #870 BEAM: Meson Area - Polarized Proton Beam PROTOTYPE DETECTORS FOR THE SDC #870	George H. Trilling	FERMILAB LAWRENCE BERKELEY LABORATORY SSC LABORATORY
	Request 1 Jan, 93 Unspecified Withdrawn 4 Jan, 94		
871	CP VIOLATION #871 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	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 NEW MEXICO STATE UNIVERSITY UNIVERSITY OF VIRGINIA
	Request 21 Mar, 93 Unspecified Approval 29 Jun, 94 Unspecified Stage I approval. In Progress 20 Feb, 97		
872	TAU NEUTRINO #872 BEAM: Proton Area - West BEAM DUMP #872	Vittorio Paolone	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)
	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 BEAM: Booster Accelerator Letter of Intent to Perform a Neutrino Experiment using the Fermilab 8 GEV Booster	Fred J. Federspiel and H. White	LOS ALAMOS NATIONAL LABORATORY
	Request 21 Oct, 94 Unspecified Unconsidered 21 Oct, 94		
874	CHARGED PION LIFETIME #874 BEAM: Meson Area - West Precision Measurement of the Lifetime of Charged Pions	Steve Geer	DUKE UNIVERSITY FERMILAB UNIVERSITY OF NEBRASKA ROCKEFELLER UNIVERSITY
	Request 9 Nov, 94 Unspecified Withdrawn 16 Dec, 96		

875	NEUTRINO OSCILLATIONS #875 BEAM: Main Injector Area A Long-baseline Neutrino Oscillation Experiment at Fermilab	Stanley G. Wojcicki	ARGONNE NATIONAL LABORATORY IHEP, BEIJING (PRC) CALIFORNIA INSTITUTE OF TECHNOLOGY COLUMBIA UNIVERSITY FERMILAB INDIANA UNIVERSITY JINR, DUBNA (RUSSIA) LAWRENCE LIVERMORE LABORATORY LEBEDEV PHYSICAL INST. (RUSSIA) UNIVERSITY COLLEGE LONDON (ENGLAND) UNIVERSITY OF MINNESOTA ITEP, MOSCOW (RUSSIA) OAK RIDGE NATIONAL LABORATORY UNIVERSITY OF OXFORD (ENGLAND) PNPI, ST. PETERSBURG (RUSSIA) IHEP, PROTVINO (SERPUKHOV)(RUSSIA) RUTHERFORD-APPLETON LABS.(ENGLAND) STANFORD UNIVERSITY SUSSEX UNIVERSITY (ENGLAND) TEXAS A&M UNIVERSITY UNIVERSITY OF TEXAS AT AUSTIN TUFTS UNIVERSITY WESTERN WASHINGTON UNIVERSITY
	Request 9 Feb, 95 Unspecified Unscheduled 2 May, 95		
876	CDF HARD DIFFRACTION STUDIES #876 BEAM: Collision Area (B-0) Proposal for Hard Diffraction Studies in CDF	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
	Request 17 Jan, 95 Unspecified Data Analysis 20 Feb, 96		
877	AXION SEARCH #877 BEAM: Beam Not Applicable Measurement of the Magnetically-Induced QED Birefringence of the Vacuum and an Improved Laboratory Search for Axions	Siu Au Lee	COLORADO STATE UNIVERSITY FERMILAB JOINT INST. FOR LAB. ASTROPHYSICS SSC LABORATORY
	Request 28 Mar, 95 Unspecified Unconsidered 28 Mar, 95		
878	SPIN STRUCTURE FUNCTION PHYSICS #878 BEAM: Main Injector Area Spin Structure Function Physics at Fermilab.	Joel M. Moss	LOS ALAMOS NATIONAL LABORATORY
	Request 7 Nov, 95 Unspecified Unconsidered 7 Nov, 95		
879	B PHYSICS TEST BEAM PROGRAM #879 BEAM: Meson Area - Test Beam A Test Beam Program for Future B Physics Experiments at Fermilab	Joel N. Butler and Walter Selove	CARNEGIE-MELLON UNIVERSITY FERMILAB UNIVERSITY OF PENNSYLVANIA SYRACUSE UNIVERSITY
	Request 16 Mar, 95 Unspecified Unconsidered 16 Mar, 95		
880	B PHYSICS TEST BEAM PROGRAM #880 BEAM: Meson Area - Test Beam Proposal for Test Beam Running of the CLEO III RICH Detector	Sheldon L. Stone	CARNEGIE-MELLON UNIVERSITY FERMILAB UNIVERSITY OF MINNESOTA SYRACUSE UNIVERSITY WAYNE STATE UNIVERSITY
	Request 16 Mar, 95 Unspecified Unconsidered 16 Mar, 95 Data Analysis 19 May, 97		
881	AUGER PROJECT R&D #881 BEAM: Beam Not Applicable A Request for Fermilab R&D Support for the Pierre Auger Project.	Paul M. Mantsch	FERMILAB
	Request 6 Nov, 95 Unspecified Unscheduled 8 Oct, 96		
882	SEARCH FOR LOW MASS MONOPOLES #882 BEAM: Beam Not Applicable A Search for Low Mass Monopoles	George R. Kalbfleisch	UNIVERSITY OF OKLAHOMA
	Request 15 Aug, 95 Unspecified Unscheduled 23 Jul, 96 In Progress 23 Sep, 96		

883	COSMIC RAY CALORIMETER CALIB. #883 BEAM: Meson Area - West Calibration of Cosmic Ray "Thin Ionization Calorimeter" Unconsidered 26 Oct, 95 Data Analysis 6 Aug, 97	James H. Adams	LEBEDEV PHYSICAL INST. (RUSSIA) MOSCOW STATE UNIVERSITY (RUSSIA) NAVAL RESEARCH LABORATORY
884	COSMIC RAY DETECTOR TEST #884 BEAM: Meson Area - West A proposal for a Beam Test of the Advanced Thin Ionization Calorimeter Detector Unconsidered 1 Feb, 96 Inactive 15 Mar, 99	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
885	SLOAN DIGITAL SKY SURVEY #885 BEAM: Beam Not Applicable SLOAN DIGITAL SKY SURVEY Unscheduled 9 Feb, 96 In Progress 1 Jun, 98	Stephen M. Kent	FERMILAB
886	PICOSECOND X-RAY SOURCE #886 BEAM: A0 Facility Compton Scattering X-Ray Experiments at the Fermilab Electron Source Facility Unscheduled 8 Oct, 96 Setup in a Year 1 Mar, 99	Patrick L. Colestock and Adrian C. Melissinos	FERMILAB UNIVERSITY OF ROCHESTER
887	PET ACCELERATOR #887 BEAM: Beam Not Applicable A RFQ Linear Accelerator for PET Isotope Production Unscheduled 21 Jun, 95 Completed 31 Aug, 98	Ralph Pasquinelli	FERMILAB
888	P-BAR+NUCLEI STUDIES #888 BEAM: Main Injector Area P-Bar + A Studies of the Nuclear Equation-of-State Unconsidered 15 Jul, 96	Vic. E. Viola	INDIANA UNIVERSITY
889	NEUTRINOS AT THE BOOSTER #889 BEAM: Booster Accelerator Letter of Intent to Study Neutrino Oscillations Using the Fermilab Booster Beam Unconsidered 6 Aug, 96 Inactive 15 Mar, 99	Alexander Abashian	VIRGINIA TECH
890	PLASMA WAKE-FIELD ACCELERATOR #890 BEAM: A0 Facility Advanced Accelerator Test at the Fermilab Electron Source Facility Unscheduled 8 Oct, 96 Setup in a Year 1 Mar, 99	James R. Rosenzweig	UNIV. OF CALIFORNIA, LOS ANGELES FERMILAB
891	DARK MATTER SEARCH #891 BEAM: Beam Not Applicable The Cryogenic Dark Matter Search (CDMS) Unscheduled 4 Mar, 96 In Progress 1 Jan, 98	Roger L. Dixon	FERMILAB
892	CMS AT FERMILAB #892 BEAM: Beam Not Applicable The U.S. Compact Muon Solenoid (CMS) Collaboration at Fermilab Unscheduled 8 Oct, 96	Daniel R. Green	FERMILAB
893	LHC ACCELERATOR #893 BEAM: Beam Not Applicable Design and Construction of Interaction Regions at the CERN Large Hadron Collider (LHC) Unscheduled 8 Oct, 96	James B. Strait	FERMILAB
894	CPT TEST #894 BEAM: Main Injector Area An Experiment Studying Kl - Ks Interference to Test CPT Conservation at the Planck Scale Unconsidered 7 Oct, 96	Gordon B. Thomson	RUTGERS UNIVERSITY TRIUMF (CANADA)
895	PIXEL DETECTOR TEST #895 BEAM: Meson Area - Test Pixel Detector Test Withdrawn 28 Jan, 98	Simon Kwan	FERMILAB
896	RADIO COHERENCE TEST #896 BEAM: Main Injector Area Test of the Principle of Radio Coherence Unconsidered 4 Nov, 96	David Besson	UNIVERSITY OF KANSAS

897	BTeV R&D #897 BEAM: Collision Area (C-0) BTeV: A Heavy Quark Program at C0 +----------+ Unconsidered 18 May, 97 Unscheduled 13 Jan, 98	Joel N. Butler and Sheldon Stone	UNIV. OF CALIFORNIA, DAVIS CARNEGIE-MELLON UNIVERSITY CBPF (BRAZIL) UNIVERSITY OF COLORADO AT BOULDER FERMILAB UNIVERSITY OF FLORIDA ILLINOIS INSTITUTE OF TECHNOLOGY UNIVERSITY OF ILLINOIS, CHAMPAIGN INFN, MILANO (ITALY) UNIVERSITY OF MINNESOTA NANJING UNIVERSITY (PRC) NEW MEXICO STATE UNIVERSITY SUNY AT ALBANY NORTHWESTERN UNIVERSITY OHIO STATE UNIVERSITY INFN, PAVIA (ITALY) UNIVERSITY OF PENNSYLVANIA UNIV.OF PUERTO RICO - MAYAGUEZ UNIV.OF SCI & TECH., HEFEI (PRC) SHANDONG UNIVERSITY (PRC) SYRACUSE UNIVERSITY UNIVERSITY OF TENNESSEE, KNOXVILLE TUFTS UNIVERSITY VALPARAISO UNIVERSITY VANDERBILT UNIVERSITY UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY
898	MiniBooNE #898 BEAM: Booster Accelerator An Experiment to Measure nu-mu->nu-e Oscillations and nu-mu Disappearance at the Fermilab Booster +----------+ Unconsidered 16 May, 97 Unscheduled 4 Jun, 98	Janet M. Conrad and William Charles Louis	UNIV.OF CALIFORNIA, RIVERSIDE UNIVERSITY OF CINCINNATI COLUMBIA UNIVERSITY) EMBRY RIDDLE AERONAUTICAL UNIV. FERMILAB LOS ALAMOS NATIONAL LABORATORY LOUISIANA STATE UNIVERSITY LOUISIANA TECH UNIVERSITY
899	PARTICLE PRODUCTION #899 BEAM: Collision Area (C-0) Particle Production at Zero Degrees from the +----------+ Rejected 16 May, 97	Michael Longo	CASE WESTERN RESERVE UNIVERSITY LOUISIANA STATE UNIVERSITY UNIVERSITY OF MICHIGAN FERMILAB UNIVERSITY OF TENNESSEE
900	D-0 FORWARD PROTON DETECTOR #900 BEAM: Collision Area (D-0) A Forward Proton Detector at D-0 +----------+ Unconsidered 17 Sep, 97 Unscheduled 29 May, 98	Harry Weerts and Hugh E. Montgomery	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 UNIV. OF CALIFORNIA, DAVIS UNIV. OF CALIFORNIA, IRVINE UNIV. OF CALIFORNIA, RIVERSIDE CBPF (BRAZIL) CEN-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 KOREA UNIVERSITY, SEOUL (KOREA) INP, KRAKOW (POLAND) KYUNGSUNG UNIVERSITY, PUSAN(KOREA) LAL, ORSAY (FRANCE) 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) NORTHEASTERN UNIVERSITY NORTHERN ILLINOIS UNIVERSITY NORTHWESTERN UNIVERSITY NOTRE DAME UNIVERSITY UNIVERSITY OF OKLAHOMA PANJAB UNIVERSITY (INDIA) 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) SEOUL NATIONAL UNIVERSITY (KOREA) TATA INSTITUTE (INDIA) TEXAS A&M UNIVERSITY UNIVERSITY OF TEXAS AT ARLINGTON UNIVERSITY OF WASHINGTON

901	RECYCLER ELECTRON COOLING #901 BEAM: Beam Not Applicable Recycler Medium Energy Electron Cooling Experiment +---------- + Unscheduled 14 Nov, 97	Sergei Nagaitsev	IHEP, BEIJING (PRC) BUDKER INST. NUCLEAR PHYS (RUSSIA) FERMILAB INDIANA UNIVERSITY
902	EXOTIC ATOMS #902 BEAM: Main Injector Area Particle Mass Measurement and Strong Interaction Studies with Exotic Atoms Using X-Ray Crystal Spectrometer +---------- + Unconsidered 24 Sep, 97	Yuri M. Ivanov	PNPI, ST. PETERSBURG (RUSSIA)
903	TEST FOR ANTIHYDROGEN SPECTROSCOPY#903 BEAM: Booster Accelerator A Test Experiment at the Fermilab Booster to Study the Feasibility of Fast Antihydrogen Spectroscopy +---------- + Unconsidered 20 Mar, 98	Mark A. Mandelkern	UNIV. OF CALIFORNIA, IRVINE FERMILAB UNIVERSITY OF ROCHESTER
904	MUON COLLIDING R&D #904 BEAM: Unspecified Beam Ionization Cooling Research and Development Program for a High Luminosity Muon Collider +---------- + Unconsidered 15 Apr, 98	Steve Geer	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 THOMAS JEFFERSON LAB
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 +---------- + Unconsidered 15 Apr, 98	Peter S. Cooper	FERMILAB IHEP, PROTVINO (SERPUKHOV)(RUSSIA) UN.AUTO.DE SAN LUIS POTOSI(MEXICO) UNIVERSITY OF TEXAS AT AUSTIN
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 +---------- + Unconsidered 15 Apr, 98	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
907	PARTICLE PRODUCTION #907 BEAM: Main Injector Area Proposal to Measure Particle Production in the Meson Area Using Main Injector Primary and Secondary Beams +---------- + Unconsidered 15 Apr, 98	Rajendran Raja	BROOKHAVEN NATIONAL LABORATORY FERMILAB LAWRENCE LIVERMORE NTL. LABORATORY STANFORD UNIVERSITY

908	D-0 SILICON TRACK TRIGGER #908 BEAM: Collision Area (D-0) A Silicon Track Trigger for the D0 Experiment in Run II	Harry Weerts and Hugh Montgomery	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 UNIV. OF CALIFORNIA, DAVIS UNIV. OF CALIFORNIA, IRVINE UNIV. OF CALIFORNIA, RIVERSIDE CBPF (BRAZIL) CEN-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 KOREA UNIVERSITY, SEOUL (KOREA) INP, KRAKOW (POLAND) KYUNGSUNG UNIVERSITY, PUSAN(KOREA) LAL, ORSAY (FRANCE) 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) NORTHEASTERN UNIVERSITY NORTHERN ILLINOIS UNIVERSITY NORTHWESTERN UNIVERSITY NOTRE DAME UNIVERSITY UNIVERSITY OF OKLAHOMA PANJAB UNIVERSITY (INDIA) 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) SEOUL NATIONAL UNIVERSITY (KOREA) TATA INSTITUTE (INDIA) TEXAS A&M UNIVERSITY UNIVERSITY OF TEXAS AT ARLINGTON UNIVERSITY OF WASHINGTON

Unconsidered	21 Sep, 98
Unscheduled	29 Jan, 99

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, 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) 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 UNIVERSITY COLLEGE LONDON(ENGLAND) WASEDA UNIVERSITY (JAPAN) UNIVERSITY OF WISCONSIN - MADISON YALE UNIVERSITY
	Unconsidered 22 Sep, 98 Unscheduled 29 Jan, 99		
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
	Unconsidered 1 Aug, 98		
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)
	Unconsidered 23 Nov, 98		
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)
	Unconsidered 1 Feb, 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
	Unconsidered 29 Dec, 98		

*** End of Report ***