fermilab report

Fermi National Accelerator Laboratory Monthly Report February 1977

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F. T. Cole, Editor R. Donaldson, Assistant Editor

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THE COVER: Aerial view of the Meson Laboratory looking toward the Central Laboratory Building. (Photograph by Tony Frelo)

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CONTENTS FEBRUARY 1977

VISITING GRADUATE STUDENTS AT FERMILAB

Efforts are underway to improve the ambience of Fermilab for graduate students who come from university physics departments to participate in experiments that are running here. In the past, many students have found the Laboratory lacking in facilities for them and in opportunities for contacts with their peers. The effort to improve their lot has come in large part from the graduate students themselves, with help from the Users Executive Committee and from Cynthia Sazama of the Users Office.

As part of the effort to have more contact between graduate students from different experimental groups, a conference room on the 7th floor of the Central Laboratory has been made into a coffee lounge at night (5 p. m. to 8 a. m.). This will also provide a place for notices and other communications of interest to students. In addition, graduate students are meeting every Thursday for lunch in the small dining room to get acquainted and to hear informal talks by graduate students.

There are also needs for other, somewhat more formal, educational aids. The Library is initiating a special reserve of physics and mathematics books of interest to graduate students. The students have also requested continuation of the Academic Lecture Series.

Tours of the experimental areas, especially of experiments where students can show their peers what they are doing, are being carried out. A tour of the accelerator has been scheduled several times, but has always had to be cancelled because of the vicissitudes of the weather and the resulting vagaries of the accelerator schedule.

Other possible activities are in the discussion stage, including possible get-togethers at the Users Center and trips to cultural events in the area. A determined effort is being made to avoid a formal organization, but persons interested may contact John Cumalat of E25 and the University of California at Santa Barbara (Ext. 3888) or Alan Breakstone of E152 and the University of California at Santa Cruz (Ext. 3889).

A REPORT ON THE MESON AREA

C. N. Brown

It is now a tradition that the status of the Meson Area and its experimental program be reported each 18 months in this publication. In January, 1974, Dick Lundy reported on the newly created Meson Detector Building and the preparation of the first experiments in the area. In August, 1975, Peter Koehler reported that all beam lines were operating and many experiments were being completed. At this time, January, 1977, all the original experimental proposals have been disposed of, as well as a large number of interesting new ideas that have been proposed in the last few years. It appears that there is a good possibility of completing all the currently approved experiments in the near future. Thus the Meson Laboratory is at a crossroad and much thought is being given by various physicists as to the appropriate future directions for experiments in the Meson Area.

In the last 18 months, the accelerator has provided beam during 65 of the 79 weeks. For 60 weeks, the incident energy was 400 GeV/c; four weeks were run at energies of 200 or 300 GeV/c. The operating record of the Meson Area during this time was extremely good, except for the first months of 1976, when the meson production target train developed problems. On December 26, 1975, the water-cooled C2 collimator on the target train developed a leak. After the excess water was drained from the target tube, the Meson Area returned to high-energy physics with only reduced intensity permitted. An improved spare collimator was hastily fabricated in Lab 6. During the March, 1976 facility and development shutdown, the target train

was pulled and the new collimator installed. This shutdown had to be extended one week in the Meson Area to complete the target repair.

While the collimator was being replaced, it was noticed that the movable target mechanism was completely rusted and inoperable. Because of the unserviceability of the present target mount, it was decided to run with the current target and fabricate an improved, more serviceable spare. Many other items on the train are also in need of repair or upgrading and funds were allocated to construct a second-generation Meson target train. Currently, it is planned to do some of this work during the forthcoming spring shutdown.

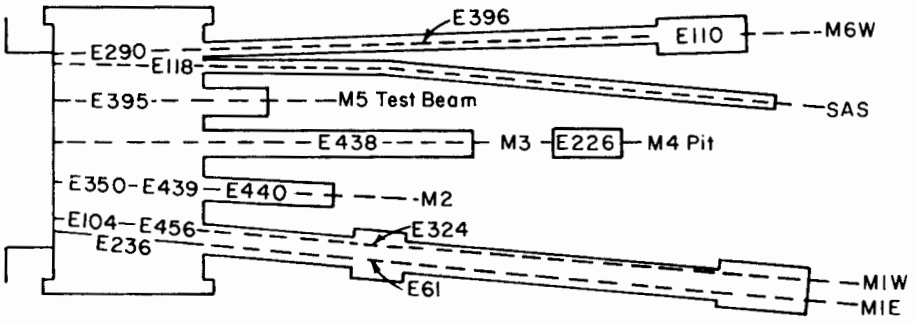
The present C2 water-cooled collimator has been in place nine months and has absorbed more integrated beam energy than its predecessor. Its main component is an aluminum core 10 ft long which contains the defining holes of the secondary-beam lines, plus water-cooling holes drilled longitudinally through its entire length. The 0.060-in. square by 8-in. long beryllium production target, which is frozen in place on the inoperable target shuttle, has been receiving beam now for three years. This little Be knitting needle has done yeoman duty and should be entered in the Guiness Book of World Records for having been bombarded by high-energy protons so long in the service of physics.

The secondary particles produced so copiously by the Be target have been used to complete a large number of experiments. Five particle-search experiments have led to the conclusion that charmed-particle production in hadron collisions is not large and is buried under the general multi-meson backgrounds. In a continuing sequence of strong-interaction measurements,

various experiments have measured total cross sections, elastic-scattering cross sections, and charge-exchange cross sections. Lately, more detailed second-generation studies of hadron interactions have included inclusive particle spectra measurements, multiplicities, and polarization measurements. Surprises include the unexpected large polarization of lambda's produced at high transverse momentum, the observation of jet-like behavior of high transverse-momentum events on the multiparticle spectrometer and the copious production of high transverse-momentum π^{o}'s by incident charged pions.

Clearly, the general features of strong interactions at Fermilab energies are now basically mapped out by these completed first-generation experiments. It is thus the task of current experiments to check detailed predictions of various theoretical models, including Regge models and scaling predictions. Alternatively, they can exploit the higher energies and intensities now available in the various meson beams to search for new particles at higher sensitivities or to study hadron jets and high $p_{\perp}$ phenomena in more detail. The locations of the experiments currently occupying real estate in the Meson Detector Building are indicated in the figure at the top of page 4.

In order to utilize the higher-energy secondaries produced by 400-GeV/c incident protons, the meson beams have been upgraded in various ways. Recent work in the M1 pion beam has increased its maximum momentum to 400 GeV/c, adding diffracted-proton capabilities in that beam. It is instrumented to identify mesons up to 300 GeV/c.



Schematic of the Meson Area, showing locations of experiments as of January, 1977.

E61 - Polarized Scattering
E104 - Total Cross Section
E110 - Multiparticle Spectrometer
E118 - Inclusive Scattering
E226 - K^0-Electron Regeneration
E236 - Hadron Jets
E290 - Backward Elastic Scattering
E324 - Inclusive Scattering
E350 - Inclusive Neutral Pion Production
E395 - Hadron Jet Calorimeter
E396 - Diffraction Dissociation
E438 - Inelastic Neutron Cross Sections
E439 - Multi-Muon Production
E440 - Lambda Magnetic Moment
E456 - Kaon Form Factor

The M2 beam line has run much of the time transporting 400-GeV diffracted protons. Experiments have been run at intensities of the order of 2×10^8 protons/pulse and provisions are now being implemented to allow intensities at least an order of magnitude larger than this. It is also equipped with two Cerenkov counters and can transmit and identify more than 10^6 pions per pulse at 250 GeV/c.

The M3 neutron beam has seen a great deal of improvement in the collimating and sweeping stations. It was used to define a very precise

intense neutron beam for particle-search experiments E366 and E397. The broad neutron spectrum of this beam peaks at 300 GeV.

The collimators in the M4 neutral kaon beam were reconfigured last fall to provide a split double-kaon beam. This enabled E226/486, K^{O}-electron scattering, to do a precise measurement of the regeneration of kaons by electrons by alternating thin regenerators and thick regenerators in the two adjacent sharply defined neutral beams. It is currently planned to convert the M4 beam to a broad-band charged-particle beam in the spring of this year. This beam with its large (7-mrad) production angle should have a favorable percentage of K^{-} and antiprotons.

The M5 test beam became fully operational last winter and has been an unqualified success. The beam can be tuned from 5 to 50 GeV/c, but is typically set for 30-GeV negative particles. This results in a beam of about 10^{5} particles per pulse comprised mainly of pions and electrons, ideal for calibrating counters and calorimeters of all types. The beam is exceptionally easy to use and has hosted many experimenters from all three external areas at Fermilab, as well as cosmic-ray researchers from the University of Chicago.

The precision M6 pion beam has a maximum momentum of 200 GeV/c. The east branch houses the single-arm spectrometer. E118, inclusive scattering, makes full use of the seven Cerenkov counters in the beam line and spectrometer to measure all particle types simultaneously. The west branch houses the Multiparticle Spectrometer on which E260, hadron jets, was recently completed. E110, peripheral multiparticle production is now

setting up in the MPS and E290, backward elastic scattering, is setting up upstream in the west branch.

The experimental program in the Meson Area often requires the operation of all the beam lines at or near their upgraded maximum momenta and many large experimental analyzing magnets. This is accomplished within the constraints of the original power distribution and cooling-water systems by careful ramping of all major beam-line magnets and the use of four large superconducting-coil analyzing magnets. The Meson Operations Group is currently working on a project to make the optimum ramping of the magnets much easier for the experimenter to control.

A helium recovery system is now fully operational in the Meson Detector Building. This system collects the helium gas boiled off the large superconducting analyzing magnets and recompresses it into tube trailers. The gas is trucked to Lab 6 where it is purified and reliquefied by a dual CTI-1400 refrigerator system recently completed in Lab 6. This system is operated by the Cryogenic Group in the Research Services Department. Liquid helium is then returned in 1000-liter dewars to the Detector Building to cool the superconducting magnets.

The Lab 6 Helium Facility also includes provisions for open- and closed-loop testing of developmental superconducting beam-line magnets. A program is currently being manned by a Proton Department group to develop low-current, superconducting beam-line magnets. The future availability of 1000-GeV protons will require extensive use of 40-kG magnets to make efficient use of the physical plant already in existence in the three external areas.

The time is now ripe for considering possible future uses of the Meson Area. Some immediate planning for possible new experiments will take place in workshops this spring. The Multiparticle Spectrometer Workshop to discuss the future use of this large facility in the M6 West beam line will be held on March 4-5 at Fermilab. Ernest Malamud should be contacted for details. A workshop to discuss hadron-jet experiments is currently planned for March 31-April 1, 1977. Three hadron-jet experiments have been approved for running in the Meson Area, and one of them, E260, will be presenting results at these two workshops.

One clear thread of most new proposals in the Meson Area is the need for higher intensities and higher-energy secondaries. Table I lists the approximate yields in the various beam lines as of the present. It is clear that a provision for changing the apparent production angle of the M1 and M6 beam lines might help considerably at all secondary energies. Designs for the new target train are being considered that include some magnets on the train. The design goal is to create variable and yet still independent production angles for M1 and M6. Only the M6 line is currently thought to be limited in its maximum momentum. Thus the possibility of using the first series of doubler dipoles to raise its capability to 400 GeV is being studied.

Many people have speculated on the longer-range future of the Meson Area. The 1976 Summer Study Report on a 1000 GeV Meson Area concept outlines some of the possibilities. It is hoped, of course, that a continuing

series of sound experiments and unexpected surprises will provide the life-blood for the Meson Area. It is certainly true that opportunities exist in all the Meson beam lines for good proposals to enjoy reasonably swift execution. The main constraint will be the competing demands for funds for other laboratory projects that might command a higher physics priority.

Table I. Current Properties of the Meson Beam Lines.[a]

M1	pion or diffracted proton beam line 2×10^{7} π^- at 100 GeV/c $\approx 10^{6}$ π^- at 250 GeV 10^{7} p at 400 GeV[b]	θ_p = 3 mrad
M2	pion or diffracted proton beam line approximately the same as M1 except 10^{9} p at 400 GeV	θ_p = 1 mrad
M3	neutron beam neutron spectrum broad peaks at 300 GeV 10^{7} neutrons in 2 in.^{2} beam	θ_p = 1 mrad
M4	neutral or charged kaon beam 10^{6} K^o below 200 GeV in 2 in.^{2} beam 10^{6} K^- at 100 GeV[b] 3×10^{5} $\bar{p}$[b] at 100 GeV	θ_p = 7.5 mrad
M5	test beam 5-40 GeV/c 10^{5} particles at 30 GeV	θ_p = 20 mrad
M6	high precision pion beam 200 GeV maximum momentum 10^{6} π^- at 200 GeV	θ_p = 2.5 mrad

[a] Particle yields quoted for 2×10^{12} protons incident on meson target
[b] Estimated, capability being installed.

Experiment 357/472 (Purdue, Michigan, Fermilab), a particle search experiment, set up a double magnetic spectrometer in the M2 diffracted-proton beam. The spectrometer contained five drift chambers and three Cerenkov counters on each arm.

Members of the E216/456 collaboration (UCLA, Notre Dame, Pittsburgh, Dubna): back row (left to right) A. Vodopyanov, E. Tsyganov, D. Stork, N. Tsyganova, T. Nigmanov, C. Rey, P. Shepard, and John Zumbro; front row (left to right) Z. Guzik, C. May, and P. Rapp. Their experiment, measuring K-e elastic scattering to determine the kaon electromagnetic form factor, is currently set up in the M1 meson beam.

NOTES AND ANNOUNCEMENTS

RETIREMENT. . .

Captain Bradley F. Bennett, Executive Vice President of Universities Research Association, is retiring on February 24. Brad Bennett was "present at the creation" of Fermilab and has been active ever since in the development of the Laboratory.

TRANSITIONS. . .

Eric Jarzab, Food Service Manager, is leaving Fermilab on February 28 for a position as food-service manager at Argonne National Laboratory West in Idaho Falls, Idaho. John Barry has been named interim manager.

Cheryl Stadtfeldt of Public Information is leaving the Laboratory on February 18. She has been an important link between Fermilab and the public in managing tours of the Laboratory by many thousands of visitors.

HADRON-JET EXPERIMENTS WORKSHOP. . .

This is the second in a series of three workshops to be held at Fermilab during the spring in preparation for the 1977 summer meeting of the Program Advisory Committee. The workshop is scheduled for March 31-April 1, 1977; it will be preceded by the Multiparticle Spectrometer Workshop early in March and followed by the Future Neutrino Experiments Workshop later on in April.

Currently, the program for the Hadron-Jet Experiments Workshop includes reports on the present-generation hadron-jet experiments (E260, E236, and E395) to be followed by presentations of proposals for second-generation experiments. A panel composed primarily of PAC members will

be in attendance. Following the presentations and discussion, the panel will formulate recommendations on the proposals for second-generation experiments. These recommendations will be transmitted to the full PAC for their consideration at the summer meeting.

The Hadron-Jet Experiments Workshop will be an open meeting and all interested physicists are invited to attend and to participate in the discussion to the extent time permits. Experimenters interested in submitting proposals for future hadron-jet experiments at Fermilab should observe the March 4 deadline for submission of proposals to be considered at this workshop.

FUTURE NEUTRINO EXPERIMENTS WORKSHOP. . .

This workshop (also an open meeting) is scheduled to be held at Fermilab April 21-22, 1977. Our purpose in holding this meeting is to consider proposals for new neutrino experiments and related facilities. There will be representatives from the PAC at this meeting, probably again in the form of a panel, and the outcome of the discussions will form a major topic for consideration at the summer PAC meeting. Groups interested in submitting proposals for future neutrino experiments to be presented at this workshop should observe the March 25 deadline.

Questions pertaining to either the Hadron-Jet Experiments Workshop or the Future Neutrino Experiments Workshop should be addressed to T. Groves in the Director's Office.

FUTURE COLLIDING-BEAM EXPERIMENTS ACTIVITIES. . .

There are two announcements on future activities of the Colliding Beam Experiments Department. These are a March Workshop on Colliding Beams and the announcement of the Fermilab 1977 Summer Study on Colliding Beams.

The Workshop on Colliding Beams is one in a series of regular open workshops and will be held at Fermilab on March 25. Several reports will be given on the various activities of the Department. The directions of future work will be discussed and User involvement in various ways is encouraged.

A Summer Study on aspects of colliding beams at Fermilab will be held at Aspen, Colorado, for a three-week session from June 27 to July 15, 1977. The study will cover both proton-proton and antiproton-proton interactions. The utilization of the Energy Doubler/Saver beam in collision with the Main-Ring beam for proton-proton collisions will be explored. Use of the Main Ring or ultimately the Energy Doubler/Saver will provide the focus for antiproton-proton collision studies.

The purpose of the Study will be to examine the designs of the intersection regions, experimental areas, techniques to obtain high luminosity for both pp and $\bar{p}p$ collisions, possible detectors, and physics objectives. Working groups will be established to study these and other topics.

Participants will be expected to be supported by their home institutions. Because of the limited facilities available, the number of invitees will have to be quite restricted. Those desiring to participate should indicate their specific fields of interest by March 25 to J. K. Walker, Ext. 4272.

SUMMER HOUSING. . .

The Housing Office is now making plans and taking reservations for accommodations for the summer. Since there is always an influx of experimenters during the summer months, the office established March 31 as a deadline for receipt of reservations for on-site housing.

In order to assure an equitable distribution, Fermilab housing assignments will be determined again this year by the same priority and lottery system established by the Laboratory last year. The housing assignments will be made early in April based on the expected running schedule for the summer, and responses will be mailed out by April 15.

The priority system allocates four houses or apartments to the theoretical program and the remaining houses, apartments, and dormitory rooms to experimenters on running experiments, experiments in the test stage, and experiments setting up for the summer and fall. After housing has been allocated to foreign experimenters at Fermilab under official exchange agreements, the priority is one house or apartment and one dormitory room per running experiment. If there is still housing available after each experimental group with an experiment running during the summer has received one house or apartment and one dormitory room, there will be a second-round assignment by lot. Five of the eighty-nine dormitory rooms will be set aside for the use of people on running experiments who were not selected in the assignment and will be staying longer than three weeks. These rooms must be reserved at least one month prior to expected date of occupancy. There will not be double occupancy in dorm rooms unless it is requested.

The starting dates for summer occupancy will be staggered over the week of May 29 through June 4. If for any reason assigned housing is not to be used for some portion of the summer, the Housing Office should be notified so that it can be utilized by another group.

In the event that on-site housing facilities are filled, the Housing Office will assist in finding off-site accommodations.

RESEARCH ACTIVITIES DURING JANUARY 1977

James MacLachlan

The accelerator began the month running with a 10-second cycle providing a 2-second spill on a 200-GeV front porch and a 2-second spill at the 300-GeV flattop. This mode of operation was highly successful; typically 10^{13} protons were extracted at each energy. A total of 1.9×10^{18} protons were accelerated at 200/300 GeV before returning to 400 GeV on January 20. Main-Ring intensity was limited to about 1.6×10^{13} ppp during the 400-GeV running because the Neutrino Area was not ready for high-intensity fast spill. The Main Ring was run with a 1-second flattop with the intention of maintaining a steady set of running conditions for several weeks which would allow a reasonable repetition rate for the 15-ft bubble chamber. A total of 0.52×10^{18} protons were accelerated to 400 GeV. The accelerator provided beam for the experimental program for 441 hours, 64% of 696 hours scheduled for January. Thus, beam averaged 100 hours per week despite four separate failures in the 13.8 kV Main-Ring pulsed power feeder system. Operation was interrupted by feeder troubles two days starting January 2, a day each January 15 and 25, and two days starting January 31. An additional day was lost January 17 because of an electrical power reduction caused by unusual demand and power-company equipment failures resulting from severe weather followed by a Main-Ring magnet replacement; yet another day was lost January 28 because of a sequence of failures including a shorted pulsed bump magnet for the Main-Ring abort system, a shorted electrostatic extraction septum, and vacuum leaks in D-sector of the Main Ring. This

degree of unscheduled interruption substantially reduced the operating efficiency of the experiments, particularly during the 400-GeV running.

The 200/300 GeV running was scheduled principally for the benefit of the Proton Area where Particle Search #325 collected data on the energy dependence of the production of high-mass dimuons. Polarized Scattering #61 in the Meson Area was also a major beneficiary of the 300-GeV operation because it proved possible to tune the east branch of the M1 line to 300 GeV and achieve about 9×10^{6} protons for 10^{12} on target. The secondary flux of about 5×10^{7}/pulse achieved near the end of their 300-GeV running enabled them to get a good start on a measurement of polarization in elastic scattering near the dip at $t \approx 1.4$ $(GeV/c)^2$. The Neutrino Area was off during this period while the triplet train was being removed from the target tube, Neuhall was cleared of the contamination resulting from the collimator failure in late December, and the two-horn focusing system was installed for use with the 15-ft bubble chamber. The chamber was in standby much of the time during the horn installation, but shortly before the resumption of 400-GeV running, the main chamber vent valve became plugged. A partial emptying of the chamber was required. The Internal Target Area continued to have helium liquefier problems. On January 10, installation of a second liquefier system borrowed from the Switchyard Group began. When this installation was completed about January 20, a new era of abundance began; even the original liquefier system began to perform in exemplary fashion.

For the last third of the month the accelerator operated at 400 GeV. The Meson Area received 400-GeV beam early on Friday, January 21, and

was joined in less than 24 hours by the Proton and Neutrino Areas. The Meson Area and Proton Area continued with nearly unchanged programs. The Neutrino Area got off to a slow start with the newly installed horn train because the 15-ft bubble chamber could not be made operational. The first attempt at refilling after the relief valve plug was unsuccessful because the chamber level gauge read incorrectly, thus leading to an insufficient transfer. The warmup from the second attempt was underway at the end of the month. Neutrino #310 received some bare target calibration running just after the area resumed operation, but was unable to serve as a backup program for $\bar{\nu}$ running because their toroidal muon spectrometer magnet had severe water flow problems. The Internal Target Area ran as steadily as the intermittent accelerator operation would allow and produced adequate liquid helium to keep the spectrometer going full time for p-p Polarization #313.

FACILITY UTILIZATION SUMMARY -- JANUARY 1977

I. Summary of Accelerator Operations

		Hours	
A. Accelerator use for physics research			
Accelerator physics research		31.9	
High energy physics research		441.1	
Research during other use		(62.3)	
	Subtotal		473.0
B. Other activities			
Accelerator setup and tuning to experimental areas		5.0	
Program interruption { Scheduled 12.0 / Adhoc 12.7		24.7	
Unscheduled interruption		241.3	
	Subtotal		271.0
C. Unmanned time			-
	Total		744.0

II. Summaries of High Energy Physics Research Use

		# of Expts.	Hours	Results
A.	Counter experiments	13	2401.5	
B.	Bubble chamber experiments	1	2.0	tests
C.	Emulsion experiments	-	-	
D.	Special target experiments	2	-	1 exp.; 1 in progress
E.	Test experiments	-	-	
F.	Engineering studies and tests	2	22.2	N0, N5 beam tests
G.	Other beam use	-	-	
		18	2425.7	

III. Number of Protons Accelerated and Delivered ($\times 10^{18}$ ppp)

		200/300 GeV	400 GeV	Total
A.	Beam accelerated in Main Ring	1.93	0.52	2.45

B. Beam delivered to expt. areas		@200	@300	@400	
Meson Area		0.00	0.24	0.18	
Neutrino Area					
	Slow Spill	0.00	0.00	0.01	
	Fast Spill	0.00	0.00	0.05	
Proton Area		0.92	0.72	0.26	
	Totals	0.92	0.96	0.50	2.38

BEAM UTILIZATION BY

	Beam	Run Dates	Hours
MESON AREA			
Polarized Scattering #61	M1E	1/1-1/31	329.5
Nuclear Chemistry #81A	M0		
K^o Charge Radius #226/#486	M4	1/4-1/31	345.7
Backward Scattering #290	M6W	1/27-1/31	2.0
Inclusive π^o #350	M2	1/27-1/31	200.2
Hadron Dissociation #396	M6W	1/4-1/27	253.5
NEUTRINO AREA			
15' $\bar{\nu}/H_2$ & Ne #180	N0	1/26	2.0
Neutrino #310	N0	1/22-1/23	22.1
Neutrino #482	N0	1/23-1/29	41.8
PROTON AREA			
p-p Elastic #177A	PW	1/1-1/31	269.3
Particle Search #325	P1	1/1-1/31	371.8
Nuclear Fragments #466	PE	1/21-1/31	
Di-Hadron #494	PC	1/1-1/31	333.0
INTERNAL TARGET AREA			
p-N Scattering #198A		1/4-1/9	96.7
p-p Polarization #313		1/18-1/20	98.5
Nuclear Fragments #442		1/21-1/31	37.4
Total for experiments			2403.5
Beam line tests and engineering studies			22.2
		Total	2425.7

EXPERIMENT -- JANUARY 1977

Activities

data: elastic scattering of protons at 300 GeV from polarized proton target

data: 1 target exposure in primary beam

data: K_S^O regeneration from a lead regenerator

tests: counter timing, Cerenkov counter & PWC system checkout

tests & data: inclusive π^O in triple Regge region

tests & data: target dissociation at ±100 GeV/c

test: checkout of the external muon identifier

calibration: straight-through muons for alignment and calibration

calibration and tests: muon calibration of calorimeters

data: p-p elastic scattering at very high transverse momentum at 200 & 400 GeV

data: production of high mass di-muon states at 200, 300, & 400 GeV

data: 1 target in progress

data: production of various high mass di-hadron combinations

data: p-p elastic and inelastic scattering

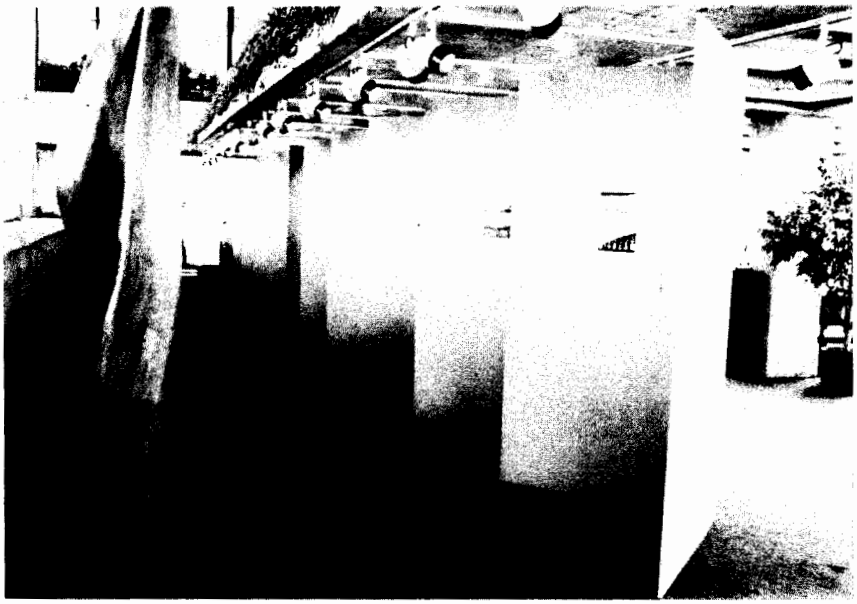
data: rescattering analysis of target protons mostly at $t = 0.8$

setup and tests

The annual President's meeting of URA was held at the Laboratory on February 4. This photograph was taken during their visit to the Accelerator Control Room.

PROPOSALS RECEIVED DURING JANUARY AND FEBRUARY 1977

No.	Title	Submitted By
523	A Proposal to Study Multiparticle Peripheral Hadron Reactions Yielding Forward π^o and η^o Mesons	A. Dzierba
524	Proposal to Study Proton-Nucleus Interactions in Emulsion Plates with Embedded Metal Powder Granules at Highest Available Energy (> 400 GeV)	R. Wilkes
525	Proposal to Study Pion-Nucleus Interactions in Emulsion Plates with Embedded Metal Powder Granules at Highest Available Energy > 300 GeV	R. Wilkes
526	Proposal for Anti-Proton Proton Studies in the Fermilab 15-Foot Hydrogen Bubble Chamber at 100 GeV	R. Lander
527	Proposal to Study Annihilation and Non-Annihilation Processes in $\bar{p}d$ Collisions in the 15-Foot Bubble Chamber	R. Lander
528	Proposal for a Detector Development Study of Acoustic Calorimetry at Fermilab Energies	A. Roberts
529	Reactions of Complex Nuclei with Pions in the Hundred GeV Range	A. Turkevich
530	Search for Charm Production in 400 GeV/c Proton Interactions	V. Fitch
531	A Proposal to Study Weak Decay Lifetimes of Neutrino Produced Particles in a Tagged Emulsion Spectrometer	N. Reay
532	A Critical Test of the Quark Confinement Model	C. Brown
533	Proposal to Measure the Rate of Formation of π-μ Atoms in $K_L^o \rightarrow \pi\mu\nu$ Decay	S. Aronson
534	Hybrid Nuclear Emulsion - 15-Ft Bubble Chamber Experiment to Study Neutrino Produced Short Lived Particles	H. Lubatti
535	Proposal to Study the Interactions of K_L^o Mesons in the Momentum Region Above 50 GeV/c Using a Pion Induced K_L^o Beam	U. Nauenberg



The exhibit, "Selected Landscape Prints from One Hundred Views of Famous Places of Edo" by Hiroshige I (1797-1858) attracted hundreds of viewers during its three-month stay on the second-floor lounge. The prints, famous as the last extensive series by Hiroshige, depicted everyday life in Edo (Tokyo) and its suburbs. On loan from the Art Institute of Chicago, the prints added another dimension to the rotating exhibits frequently seen at Fermilab.

DATES TO REMEMBER

March 4, 1977	Deadline for receipt of written materials to be considered at the Hadron Jet Experiments Workshop
March 4-5, 1977	Multiparticle Spectrometer Workshop
March 10-11, 1977	Spring meeting of the Fermilab Program Advisory Committee
March 25, 1977	Future Colliding-Beam Experiments Workshop
March 25, 1977	Deadline for receipt of written materials to be considered at the Future Neutrino Experiments Workshop
March 31, 1977	Deadline for request for Fermilab Summer Housing. Please register as soon as possible. For more detailed information, see page 16.
March 31-April 1, 1977	Hadron Jet Experiments Workshop
April 21-22, 1977	Future Neutrino Experiments Workshop
May 6, 1977	Deadline for receipt of all new proposals and other written materials to be considered at the Summer meeting of the Program Advisory Committee
May 13-14, 1977	Users Annual Meeting
May 19-20, 1977	Proposal Presentation Meeting
June 18-24, 1977	Summer meeting of the Fermilab Program Advisory Committee