

RECENT DOINGS IN THE INTERNAL-TARGET AREA

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Two experiments, E-522 and E-552, have recently completed data-taking in the Internal Target Area (C0). These are the latest in a series of experiments by a number of groups to study collisions of Main-Ring protons on a gas jet intersecting the beam.

Experiment #522, an experiment by a group from Indiana University, studied inclusive polarization of protons in pp scattering. Similar measurements on inclusive Λ polarization in the Fermilab hyperon beam (E-8 and E-441) indicate an inclusive polarization of 28%, much larger than had been expected. A systematic study of proton polarization in the same kinematic region is important to understand the polarization mechanism.

E-552, a Rutgers-Rochester-Imperial College collaboration measured differential cross sections for pp and pd elastic scattering and isobar production in the region of large momentum transfer ($1 < -t < 5 \text{ GeV}^2$). The results may connect the observed energy independence of ISR cross sections for $|t| > 2.5 \text{ GeV}^2$ with the factor of 2 decrease in $d\sigma/dt$ between $E = 200$ and 400 GeV for $5 < -t < 10 \text{ GeV}^2$, seen in E-177 at Fermilab.

Another long series of experiments ended last November, when the Soviet-American collaboration completed their experiment E-289, a study of small-angle p-He scattering. This collaboration, working at C0 since 1972, first developed at Fermilab the cold He jet technique which allowed them to use very high jet density while maintaining acceptable Main-Ring vacuum. Many Russian physicists and their families have visited Fermilab for

extended periods during these experiments, making this a very successful Soviet-American collaboration from both humanistic and scientific points of view.

For the first time since the beginning of Fermilab beam operation, the Internal Target Area is entering an extended pause in its experimental program. No experimental operation is planned until early 1979. The experiments described above mark the completion of a rather full study of those properties of high-energy proton scattering that are accessible in the kinematic region of gas-jet experiments. That whole program will begin anew in the 1000-GeV energy range available with the Energy Doubler/Saver. C0 will be the first place where fixed-target experiments using 1000-GeV protons can be performed, since circulating beam will certainly be achieved in advance of extraction to the other experimental areas.

Meanwhile, searches for more exotic processes will become the focus of further experiments at C0 using the Main-Ring beam. E-594, a Purdue-Fermilab collaboration, has been approved for an experiment to search for anomalous (Z, A) fragments in proton collisions on a heavy nucleus gas (e. g. , Xe). Running is expected to begin in early 1979.

The technical support group at C0 has for the past year been building the electron beam for the proton/antiproton Cooling Ring, in addition to support of the experimental program. In the coming months they will play a strong role in completing the Cooling Ring and in implementing the program to improve the Main-Ring vacuum.



An historic photograph - a complete set of the heads of CØ: (left to right) Drasko Jovanovic, Peter McIntyre, Tom Nash, Ernie Malamud, and Jim Walker.

(Photograph by Don Mizicko)