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To : Professor P. Preiswerk
Chairman of the E.E.C.
From : G. Fidecaro, A. Wetherell, K. Winter and A. Zichichi
Re : Working Party on tests of slow extraction

The Working Party met twice and discussed tests on the slow extraction system to be executed during 20 shifts allocated for this in the South Hall in 1964, in view of two different aspects of this new facility:

- 1) its use in experiments on $p + p \rightarrow p + p^*$, $p + p \rightarrow \pi^+ + d$ and later more elaborate experiments. (Wetherell, Memo 11/11/63);
- 2) production of high intensity secondary beams (G. Fidecaro, A. Zichichi, 7484/NP).

The information available on the performance of the system was discussed with K. H. Reich of MPS, and it was felt that supplementary information on the following points would be of great help in designing experiments and secondary beams for the final installation.

- a) Operational experience with the system would facilitate the use of the final installation (K. H. Reich).
- b) Beam tails produced by particles fringing the septum magnet. Improvements by a dump target shadowing the septum magnet.
- c) Momentum band and stability in space. Population of emittance.
- d) General background.

During the tests the momentum of the extracted beam would be limited to 11 GeV/c. It was agreed that production data (N6) necessary to plan high intensity secondary beams should be obtained at the relevant proton momentum and that new data at 11 GeV/c would not improve much the extrapolation of existing data.

The tests on the feasibility of point 1) on the other hand can be performed on the preliminary system and would provide us with more information on the points formulated before (see attached document).

Information gained in the 20 mrad channel would be of interest with respect to background. If this proved not to be severe, the physics available at this angle on proton isobar production is considerable. The 60 mrad channel would not be expected to have background problems.

If the installations for these tests are recommended, some information on planning N6 production measurements can be obtained from the 20 mrad and from the 60 mrad channels. The tests if compatible with the general NP programme may be performed after the March shut-down (1964) at a moment most convenient from the point of view of installation.

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SLOW EXTRACTED BEAM TEST

It is proposed to measure, with good momentum resolution ($< 1\%$), the spectra of positive particles emitted at two angles, 20 and 60 mrad, from a H_2 target bombarded by the slow extracted proton beam. The target is to be placed inside the South target area opposite straight section 4.

Equipment and facilities needed for the work are as follows:

- 1) $4 M_2 - 2 M_2$ for each angle.
- 2) Two channels at 20 mrad and 60 mrad scattering angle through the shielding wall. A third channel for a wide angle monitor beam ($\approx 7\frac{1}{2}^\circ$) would also be needed.
- 3) Facilities for the use of a H_2 target near the PS.

The aim of the work is primarily to study the feasibility of performing experiments with the beam (intensity $\approx 3 \cdot 10^{11}$ protons per pulse) and to measure at various energies up to 12 GeV $p + p \rightarrow p + p^*$, $p + p \rightarrow \pi^+ + d$.

In the course of the investigations of feasibility the following points of general interest for use of the beam would be studied.

- a) "Beam tails" - any significant contribution would be detected by a background of particles entering the spectrometer in such a way as to give particles appearing at momenta above the elastic $p - p$ peak. The apparatus is very sensitive to this.
- b) Stability in space and momentum width: directly measured by the width of the elastic $p - p$ peak.
- c) Background: part of the aim of the 20 mrad channel is to have detectors to count the general forward background produced by the beam.
- d) Monitoring: a wide angle telescope would monitor run to run while a secondary emission chamber would provide a more absolute monitor. Radio chemical methods would be used to give a calibration for the chamber.

A. M. Wetherell

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