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EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

S38, 524

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26 August, 1964

FUTURE PROGRAMME OF RESEARCH

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1. A series of measurements of proton-proton scattering in the Coulomb interference region at 10, 19 and 26 GeV/c has been performed between June and August 1964. Sonic spark chambers with a data read-out onto magnetic tape were used. During the second half of the year, we plan to connect the same system of sonic chambers on line to the SDS 920 computer. The use of the computer should increase by a factor of ten the rate which our system can accept events.

In these conditions, we plan to measure a fixed momentum, ~19 GeV/c,

- a) elastic proton scattering on various nuclei (Li^6 , Li^7 , Be^9 , Cu and Pb);
- b) the detailed shape of the p-p scattering differential cross section at angles between ~5 and 26 mrad.

The high angular and momentum resolution of our system should allow us to detect in a) the influence of coherent scattering by nuclei and in b) possible structure in the angular dependence of the elastic differential cross section and in the momentum distribution of the protons scattered inelastically. This part of the programme should last until the beginning of next year.

2. The main line of research of our group during the next year will develop around the slowly ejected proton beam from s.s. 58 in the East Area. It is proposed to study high-energy, large momentum transfer p-p collisions. The gross behaviour of the elastic channel has already been explored last year in Brookhaven. The present proposal is to measure, in greater detail, the angular and energy distributions of wide angle scattered protons to differentiate between the possible statistical or potential scattering mechanisms. Other channels, such as $p p \rightarrow p^* p$, are also extremely interesting and should be amenable to study.

At the present time, it is not possible to describe in detail how the measurements will be conducted, but almost certainly counters and digitized spark chambers on line will be used.

The immediate requirements to start the programme are:

- a) that the present c_8 beam be left to our disposal during the first months of 1965. By enlarging the aperture of the present beam, it should be possible to obtain from target 61 about 10^8 protons per pulse. We want to use this rather intense beam to study the background rates that can be expected from the extracted beam;
- b) that the setting up of the slow extracted beam in the East Area be realized as soon as possible. This feature is as yet unique in the world, and we think that it will be a great asset for CERN to have it operating early in 1965.

At this stage we cannot make an accurate estimate of the machine time needed. However, the measurements described under 1) should all be finished in about four weeks of running time, while sharing the beam with other users.

As for plan 2), 2 - 4 weeks with the enhanced c_8 beam can be estimated, while no estimate at all can be made for the rest of the programme, which requires the extracted beam.