

NP/Memo/387

7 November, 1962

MEMORANDUM

CERN LIBRARIES, GENEVA



To : Professor P. Preiswerk
 From : NP Division Leader
 From : R. Mermod
 Re : Status Report on the (π p) Backward Scattering Experiment (S18)

CM-P00059268

Some improvements in the experimental set-up, as described in detail in our memorandum of 16 April, 1962, have been found possible in the mean time. They concern the momentum resolution in the detection system for the knock-on protons. The detection of the recoiling pion in coincidence with the proton is also considered.

- 1) The 2 bending magnets used in the detection system can be incorporated in a spectrometer, consisting of a symmetric quartett of quadrupole lenses. This arrangement is shown in Fig. 1. The counter S_3 is imaged on to counter S_4 . Both, counters S_3 and S_4 are subdivided into three vertical strips, each 2 cm wide and combined in coincidence channels to accept momentum bits of 1.5% width. The incident beam (not shown in Fig. 1) will also be subdivided into sections of 1.5% momentum band each. This will be done in dispersed intermediate images, which are refocused to an achromatic image on the target.
- 2) Incorporated in the spectrometer are three Cerenkov counters: two threshold Cerenkov counters C_3 and C_5 to reject pions in anti-coincidence, and one differential Cerenkov counter C_4 to identify protons. This detection system will give the same, or better rejection against particles lighter than protons, as the previous arrangement, which used two differential Cerenkov

counters. Also the multiple scattering is reduced. Multiple scattering in the 3 Cerenkov counters will only slightly smear out the momentum bite per coincidence channel ($S_3 S_4$). At 5 Gev/c incident momentum the momentum resolution will be 2%.

3) The solid angle of the spectrometer is such that the counting rates given previously remain unchanged. The improvement of the momentum resolution by a factor 3.5 will greatly help in discriminating against inelastic events. Also the spectrum of knock-on protons from inelastic events can, as a by-product, be measured with better accuracy.

4) The pions recoiling into backward hemisphere can be detected by a large scintillator, S5, in coincidence with knock-on protons. The region hit by the incident beam will be covered with a directional liquid Cerenkov counter. This will supply an additional information on the elasticity of an event, apart from momentum measurement and proton identification.

5) A parasitic test run is scheduled in December 62/January 63, in beam d_{13} , for testing rejection ratios and efficiencies in the detection system for knock-on protons.

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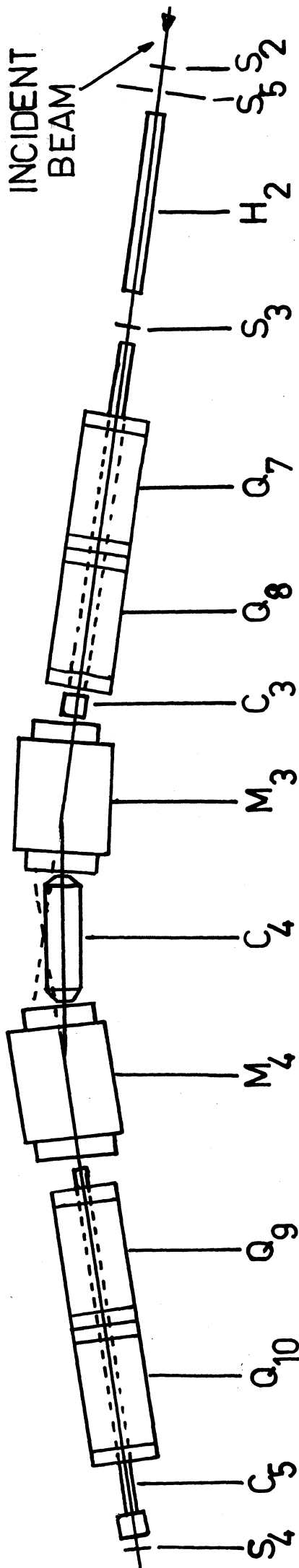


Fig1