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by the WA7 Collaboration :

CERN - Annecy (LAPP), Genova, Copenhagen, Oslo, London (U.C.L.)

Running time before the shut-down in 1980

We have measured  $\pi p$  and  $K p$  elastic scattering at 20 and 30 GeV/c in the c.m. angular range  $45^\circ$  to  $90^\circ$  or in  $-t$  from about 6 to about 25 GeV<sup>2</sup>. In the lower angular region the energy dependence is in accordance with the dimensional counting rule, while nearer to  $90^\circ$  c.m. the decrease of the cross-sections with energy is faster<sup>1)</sup>. There are Q.C.D. calculations which seem to bear out such features, and which may be related to the finite masses of the quarks<sup>2)</sup>. We are able to do measurements at higher energies, but we have meanwhile changed our experimental geometry to cover the  $-t$ -range from about 1 to 8 GeV<sup>2</sup>. The motivation for this change is that while the cross-sections are larger (thus requiring lower incident intensity), the results may still reflect the quark-quark scattering mechanism<sup>3)</sup>. Explicit calculations for the case of  $pp$  scattering, and involving three quarks-three quarks interactions, corroborate the experimental results in that  $\frac{d\sigma}{dt}$  at fixed  $t$  tends to a constant value as energy increases<sup>4)</sup>. Further theories relate the near-forward shape of the angular distribution to the valence quark structures of the particles<sup>5)</sup>. In this connection there are various interpretations of the dip-bump structures in this angular range which depend on our understanding of the quark scattering mechanism<sup>5)</sup>. Measurements of elastic scattering of negative and positive  $\pi$ ,  $K$  and  $p$  should therefore yield information on the quark-quark interactions and the quark structures of the hadrons.

We have successfully run the medium  $t$  geometry at - 50 and - 20 GeV/c and we request to run at least - 92 GeV/c before the shut-down. The expected event rates are given in CERN/SPSC/78-48. We estimate that two

periods of 10 days would be required. We would furthermore request two periods of 10 days at + 92 GeV/c and two periods at + 50 GeV/c ( $\pi^+$  and  $K^+$ ) if time becomes available.

- 1) R. Almqvist et al. EPS Geneva Conference
- 2) Private Communication from Peterson and Sachkov
- 3) CERN/SPSC/78-48
- 4) A. Donnachie and P.V. Landshoff. Preprint M/C 79/11 (1979)
- 5) G.W. Heines and M.M. Islam. Preprint 23155 (1979).