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PHYSICS I
ELECTRONIC EXPERIMENTS COMMITTEE

LETTER OF INTENTION

K p (↑) in 2.5 - 5.0 GeV/c range

by

CERN/HOLLAND GROUP

S.Anderson, C.Daum, F.Erné, J.P.Lagnaux,
J.C.Sens, F.Udo

NP/118/mk 28.9.1967

LETTER OF INTENTION

To : The members of the EEC

From : CERN/HOLLAND GROUP (S. Anderson, C. Daum, F. Erné, J.P. Lagnaux, J.C. Sens, F. Udo)

Re : K p (↑) in 2.5 - 5.0 GeV/c range

Recently the running phase of the experiment $K^- p\,(\uparrow) \rightarrow K^- p$ has been terminated. A first interpretation of the data on 19 angular distributions and polarizations has been reported at the Heidelberg Conference. The principal conclusions are :

1) The assignment $J^P(Y^*2035) = 7/2^+$, $J^P(Y^*2100) = 7/2^-$ is strongly favoured by the data; this lends support to the conclusion of an earlier analysis of Berkeley data on $K^- p \rightarrow \bar{K}^0 n$ and $K^- p \rightarrow \Lambda^0 \pi^0$.

2) If the Reggepole model as developed for high energies can be extended down to the 2-3 GeV/c region, then its prediction concerning the sign of the polarization in both $K^- p \rightarrow K^- p$ and $\bar{p}p \rightarrow \bar{p}p$ (with parameters obtained from fitting to data in the 6-11 GeV/c region) is in conflict with the data.

3) The spin/parity determination of the two highest lying resonances in our data (Y^*2260 and Y^*2340) appears to be more complicated than a straight forward extension of the analysis of the two 7/2 resonances (at 2035 and 2100 MeV, see 1)) would suggest. It is not impossible that more resonances are present in this region. $K^- p \rightarrow \bar{K}^0 n$ data presently being analyzed in Berkeley show similar complications.

The data are summarized in Fig. 1, 2 and 3 when A and B coefficients of the Legendre expansions have been plotted,

along with A coefficients from the available litterature (no B coefficients have been measured prior to this experiment). These data have been presented at the Heidelberg Conference.

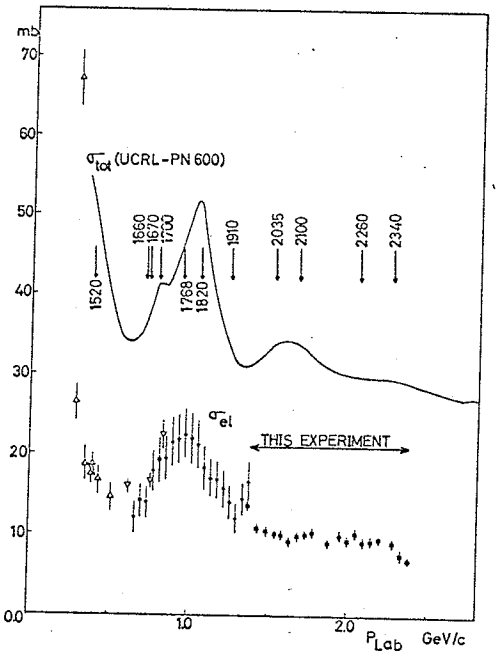
It is the purpose of this Letter to inform the EEC that we are presently studying what modifications are required to the apparatus in order to continue the experiment in the 2-5 GeV/c region. A choice is to be made between a counter hodoscopes + Cerenkov counters system, wire chambers, and/or magnetic analysis of the scattered particle(s). Furthermore, on-line handling of the data - not possible in the previous experiment, due to late delivery of a small computer - can now be incorporated into the system thus increasing the reliability of the equipment.

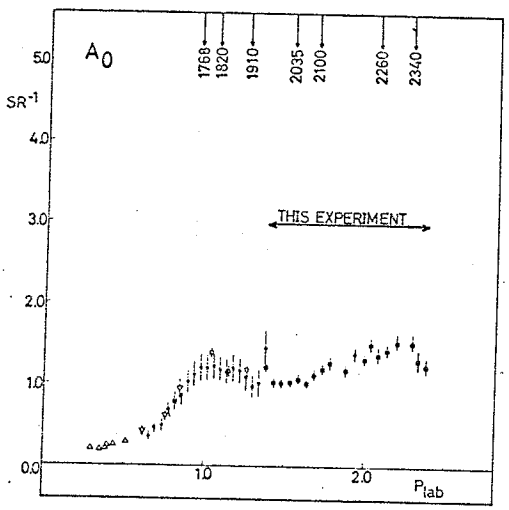
A first step in the direction of extending the experiment towards higher energies has been made recently by a proposal (C. Daum and J.C. Sens, Mémo NP/2/mk) to derive beams from a target in straight section # 8. Although the lay out is not yet frozen, the longer of these two beams is the most suited for the experiment.

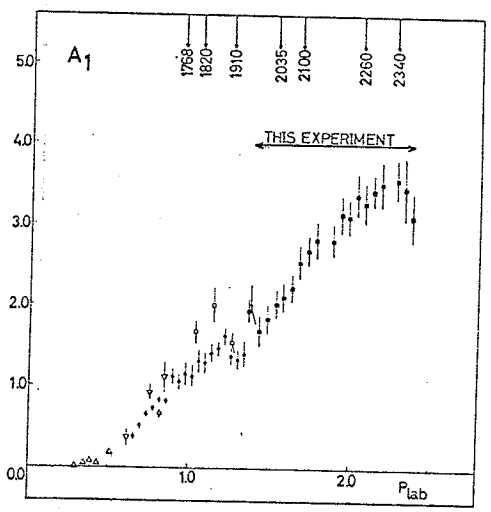
A more detailed proposal for $K^{\pm}p$ elastic scattering on polarized protons in the long beam from target #8 in the 2-5 GeV/c region is in preparation. In particular the recent results concerning possible $S = +1$ baryon resonances will be considered in the design of this experiment.

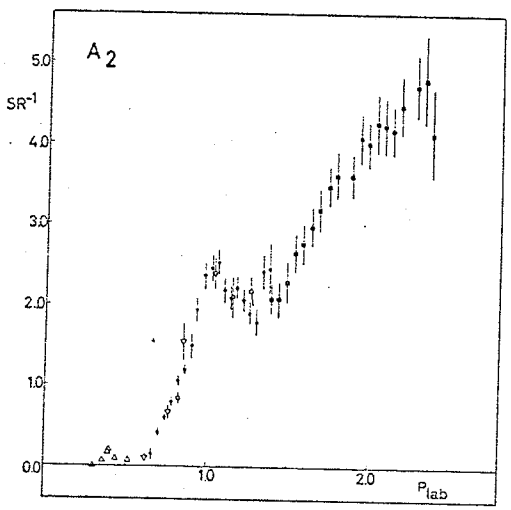
† HOLLEY ET AL.
† SODICKSON ET AL.
† WATSON
† BASTIEN
† THIS EXPERIMENT

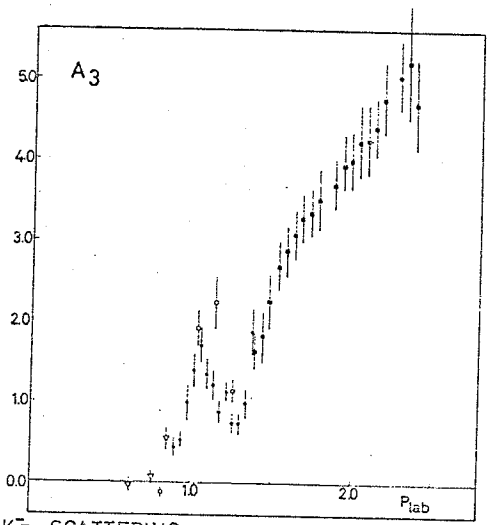
$\frac{d\sigma}{d\Omega} = \lambda^2 \sum A_l P_l(\cos\theta)$











CROSS-SECTIONS K^-p SCATTERING

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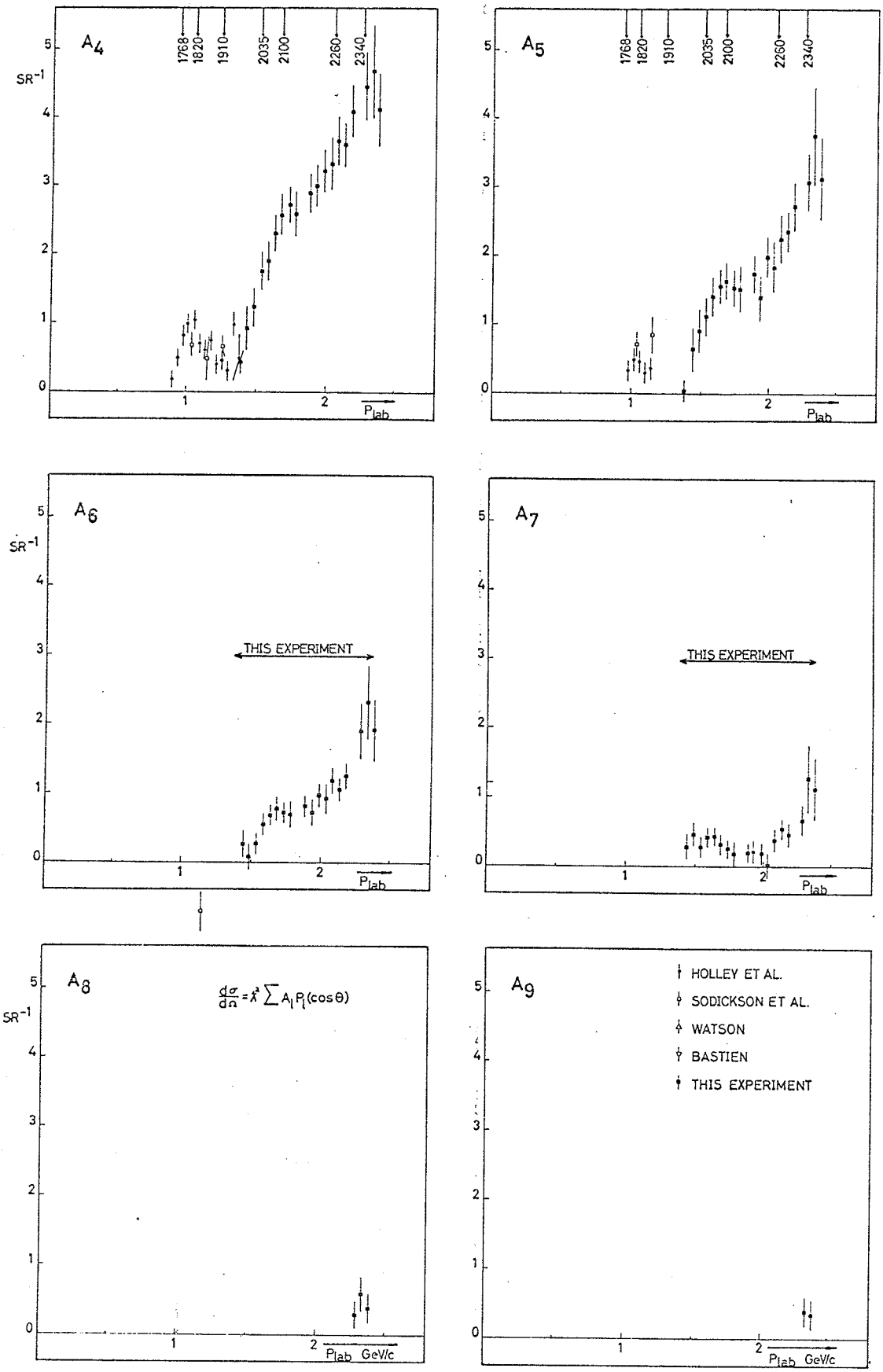

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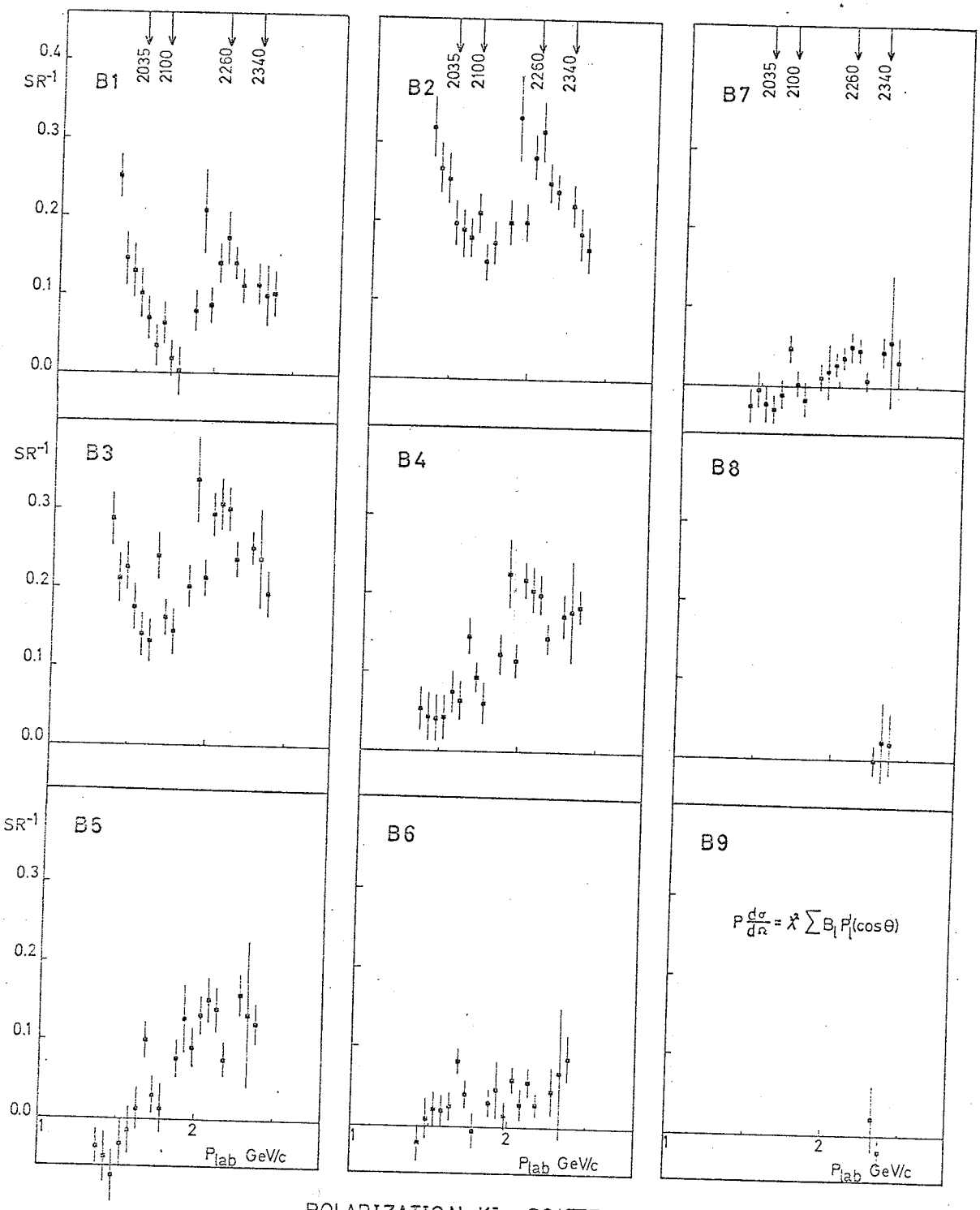

POLARIZATION K^-p SCATTERING