Final States with a Visible Λ-Hyperon in K⁻d Interactions at 3.4 GeV/c (*)

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Summary. — The final states with a Λ-hyperon produced by 3.4 GeV/c K⁻-mesons on deuterium have been studied. The main feature of the reactions is copious production of the Σ(1385), ρ(765) and ω(783) resonances. The nonvanishing polarizations of the Λ-hyperons in the Λπ⁻ channel disagree with the strong form of exchange degeneracy of the Regge picture. Λ π⁻π⁻ enhancement at about 850 MeV has been observed, however it requires further study.

1. - Introduction.

This paper is the second in a series of reports on an investigation of 3.4 GeV/c K⁻-meson interactions in the 30in. MURA deuterium bubble chamber. In the previous report (¹), emphasis was put on the study of resonance production in the final states with a visible K⁰. The present report gives the details from a similar analysis of the final states with a visible Λ-hyperon.

The details of experimental procedure and general treatment of ambiguities and biases have been discussed fully in the previous report. The selection of events and cross-sections is presented in Sect. 2. Sections 3 and 4 discuss the final states with one charged particle (plus spectator) and with three charged particles (plus spectator), respectively. Finally a summary of results is presented in Sect. 5.

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2. Selection of events and cross-sections.

The measured events were processed by means of the standard TVGP and SQUAW programs. The present study confines itself to the following reactions:

1. \( K^-d \rightarrow \pi^-\Lambda p_s \),
2. \( K^-d \rightarrow \pi^-\Sigma^0 p_s \),
3. \( K^-d \rightarrow \pi^-\pi^0\Lambda p_s \),
4. \( K^-d \rightarrow \pi^-\pi^+\pi^-\Lambda p_s \),
5. \( K^-d \rightarrow \pi^-\pi^+\pi^-\Sigma^0 p_s \),
6. \( K^-d \rightarrow \pi^-\pi^+\pi^-\pi^0\Lambda p_s \).

The same general cut which was applied to the events with a \( \bar{K}^0 \) has been used in the selection of the events. Namely, we required 1) that the \( \chi^2 \)-probability of the fit be greater than 1%, 2) that a spectator momentum be less

![Fig. 1. The square of the mass of all 1-prong vees with or without spectator events with an overall fit containing a \( \Lambda \). Visible (invisible) spectator events are shaded (unshaded). The positions of appropriate particles on the plot are indicated with arrows.](image-url)