A Double-Regge Analysis of the Reaction $K^- p \rightarrow K^- \omega p$.

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Summary. — The reaction $K^- p \rightarrow K^- \omega p$ is analysed at 6 GeV/c with a modified double-Regge model. The model compares well with the measured single-particle distributions, momentum transfer distributions and various angular correlations like Jackson angles, Treiman-Yang angles and Toller angles.

1. — Introduction.

The application of the proposed multi-Regge model (1-12) has connected many otherwise uncorrelated aspects of data on collisions producing many

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bodies in the final state. It is the aim of this phenomenological approach to
the description of many-body collisions to use as "input" as much knowledge
on two-body processes as possible, as e.g. their peripheral nature at high energy,
their general agreement with Regge predictions and the observed coupling
strengths of different processes. It is desirable to test the proposed model in
many different reactions and at various total energies.

In Sect. 2 we apply the double-Regge model to the reaction \( K^- p \rightarrow K^- \omega p \) at 6 GeV/c \(^{(13)}\). Our aim is the qualitative description of the data. We relate
the parameters of the model qualitatively to two-body processes. In addition
to the single-particle distributions of the longitudinal and transversal c.m.
momenta \( p_L^* \) and \( p_T^* \), the cosine of the c.m. angles \( \cos \theta^* \) and the four-mo-
mentum transfers \( t_\perp \)--which have already been studied with the multi-Regge
model for the reactions \( \pi^\pm p \rightarrow p \pm n\pi \) \(^{(14)}\), \( K^- p \rightarrow \Lambda + n\pi \) \(^{(15)}\) and \( p\bar{p} \rightarrow 2\pi^+ 2\pi^- \) \(^{(16)}\) in Sect. 3 we also study peripheral angles, Toller angles and Treiman-Yang
angles. The analysis shows evidence for substantial contributions from strange-
ness and baryon exchange.

2. -- The double-Regge model for the process \( K^- p \rightarrow K^- \omega p \).

It was argued \(^{(15,16)}\) that a multi-Regge analysis of a collision producing
many bodies should treat explicitly only "particles", as the Regge amplitude
automatically contains the average effects of resonance formation. Because
of the small width of the \( \omega \)-resonance it seems, however, justified to treat the \( \omega \)
as a "particle" and to attempt an analysis of the "three-body final state" \( K^- \omega p \), rather than to analyse the five-body final state \( K^- \pi^\pm \pi^0 \pi^- p \).

In a double-Regge model the process \( K^- p \rightarrow K^- \omega p \) can proceed via the
graphs shown in Fig. 1 a) to 1 d). We only list the highest-lying trajectories
which are consistent with the quantum numbers to be exchanged. These graphs
correspond to the following algebraical ordering of the final particles' longi-

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