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-momentum transfers \( t \), which have already been studied with the multi-Regge model for the reactions \( \pi^\pm p \rightarrow p + n\pi \) \((14)\), \( K^- p \rightarrow \Lambda + n\pi \) \((15)\) and \( pp \rightarrow 2\pi^+ 2\pi^- \) \((16)\) in Sect. 3 we also study peripheral angles, Toller angles and Treiman-Yang angles. The analysis shows evidence for substantial contributions from strangeness 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 \( K^- \pi^\pm \pi^\mp \pi^- p \).

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-