Summary. — Cross-sections of the inclusive reactions $K^-p \rightarrow \Lambda X$ and $K^-p \rightarrow \Sigma^+ X$ in the region of target fragmentation are analysed. A model is adopted which is based on exchange of $K$ and $K^*$ Regge trajectories and on a dual description of the reggeon-particle scattering involved in both reactions. It is shown that the model provides a detailed description of the data of a high-statistics experiment at 4.2 GeV/c incident momentum. Missing-mass distributions with a pronounced resonance structure, for various ranges of $x = p_L/p_{\text{max}}$ or $t_{\text{PY}}$, as well as distributions in $x$ and $p_T$, are reproduced by the model. The relative amounts of the $K$ and $K^*$ exchange contributions to the integrated inclusive cross-sections are evaluated. Implications for coupling strengths and reggeon-particle cross-sections are discussed. The value of the $SU_3$ parameter $F/(D+F)$ for pseudoscalar coupling is found to be $0.25 \pm 0.03$. The model is also capable of predicting the missing-mass spectrum $K^-p \rightarrow \Lambda X$ at 8.25 GeV/c.
1. Introduction.

In a previous paper, target and beam fragmentation in the inclusive reaction \( K^- p \rightarrow \Lambda X \) at 4.2 GeV/c incident momentum (lab) has been analysed (1) by applying a triple-Regge model (2) and by making use of semi-local duality (3).

In the present paper, the target fragmentations \( p \xrightarrow{K^-} \Lambda \) and \( p \xrightarrow{K^-} \Sigma^+ \), which are closely related processes, are studied in greater detail. The purpose is to test a dual description against the data from the same experiment. These data consist of 47 000 \( \Lambda \)'s and 11 000 \( \Sigma^+ \)'s in the fragmentation region. The lambda reaction will be considered first.

The Mueller diagram for \( p \xrightarrow{K^-} \Lambda \) in the proton fragmentation region (4) is indicated in fig. 1. In the fragmentation region \( t \) is restricted to values \(|t| < 1 \, (\text{GeV/c})^2\). In ref. (1) the same \( t \)-cut was used; in that paper the effective Regge trajectory \( z_R(t) \) coupling to the \( p\bar{\Lambda} \) channel was shown to be intermediate between the presumably straight \( K \) and \( K^* \) trajectories (4). The next problem which arises is how to determine their individual contributions (5).

In this paper, a description of the complete inclusive distribution function \( d^2\sigma/dM^2 dt \) in the fragmentation region is envisaged by means of which these contributions, together with order parameters, can be found.

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(4) Target protons being unpolarized, the hyperon polarization does not allow for a separation of natural and unnatural spin-parity exchange.