

Diffractive rho and phi production in DIS at HERA

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Exclusive ρ^0 electroproduction at HERA has been studied with the ZEUS detector using 120 pb⁻¹ of integrated luminosity collected during 1996-2000. The analysis was carried out in the kinematic range of photon virtuality $2 < Q^2 < 160 \text{ GeV}^2$, and γp centre-of-mass energy $32 < W < 180 \text{ GeV}$. The results include the Q^2 and W dependence of the $\gamma p \rightarrow \rho^0 p$ cross section and the distribution of the squared-four-momentum transfer to the proton. The helicity analysis of the decay-matrix elements of the ρ^0 was used to study the ratio of the $\gamma^* p$ cross section for longitudinal and transverse photon as a function of Q^2 and W . Finally, an effective Pomeron trajectory was extracted. The results are compared to various theoretical predictions.

An analysis of H1 data for rho and phi VM diffractive production, both in the elastic and proton dissociative channel is presented. The analysed data, which correspond to 51 pb⁻¹, include a total of 12500 events in the transition region from low Q^2 to the perturbative domain, $2.5 < Q^2 < 60 \text{ GeV}^2$, with data analysed in a consistent way, in particular for background estimates. The total, longitudinal and transverse cross sections are measured as a function of Q^2 , W and $|t|$. The polarisation effects are discussed in detail, in particular the Q^2 , $|t|$ and (for rho mesons) $M(\pi, \pi)$ dependences of the s-channel helicity conserving and violating amplitudes and phases. A consistent picture of VM production at intermediate and large Q^2 thus emerges from H1 HERA-1 measurements, which can be interpreted in a QCD framework.

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