

Diffractive ρ^0 and ϕ 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 $2 < Q^2 < 160$ GeV², and γp centre-of-mass energy $32 < W < 180$ 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 ρ and ϕ 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, $2.5 < Q^2 < 60$ GeV², 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 ρ 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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