Vector mesons at HERA

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The diffractive production of vector mesons $ep \to eVY$, with $V = \rho^0, \omega, \phi, J/\psi, \psi'$ or Υ and with Y being either the scattered proton or a low mass hadronic system, has been extensively investigated at HERA.

In QCD based models the diffractive production of vector mesons is viewed as a sequence of processes: the virtual photon γ^* fluctuactes in a $q\bar{q}$ pair which subsequently interacts with the proton, and eventually forms a meson bound state.

HERA offers the unique opportunity to study the dependances of diffractiv processes on several scales: the mass of the vector meson m_V, the centre-of-mass energy of the γp system W, the photon virtuality Q^2 and the four-momentum transfer squared at the proton vertex t. Strong interactions can be investigated in the transition from the hard to the soft regime, where the confinement of quarks and gluons occurs.

The presented results cover the range in Q^2 up to 100 GeV^2, the centre-of-mass energies $20 < W < 290$ GeV and the values of $|t|$ up to 20 GeV^2.

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