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Elastic Electroproduction of ρ Mesons at HERA

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The elastic electroproduction of ρ mesons is studied at HERA with the H1 detector for a photon virtuality in the range $1 < Q^2 < 60$ GeV^2 and for a hadronic centre of mass energy in the range $30 < W < 140$ GeV. The shape of the $(\pi\pi)$ mass distribution in the ρ resonance region is measured as a function of Q^2. The full set of ρ spin density matrix elements is determined, and evidence is found for a helicity flip amplitude at the level of $8 \pm 3\%$ of the non-flip amplitudes. Measurements are presented of the dependence of the cross section on Q^2, W and t (the four-momentum transfer squared to the proton). They suggest that, especially at large Q^2, the $\gamma^* p$ cross section develops a stronger W dependence than that expected from the behaviour of elastic and total hadron−hadron cross sections.

[1] H1 Collaboration, C.Adloff et al.,
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