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Proton Dissociative and Elastic Electroproduction of ρ Mesons at HERA

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The proton dissociative and elastic production of ρ mesons is studied with the H1 detector at HERA for a photon virtuality in the range $1 < Q^2 < 60$ GeV^2 and for a hadronic centre of mass energy in the range $20 < W < 150$ GeV. The shape of the $(\pi\pi)$ mass distribution in the ρ resonance region is measured as a function of Q^2. The cross section is presented as a function of Q^2, W and t (the four-momentum transfer squared to the proton) and the parameters of the pomeron trajectory are extracted. Angular distributions are studied as a function of t and Q^2 and the full set of ρ spin density matrix elements is determined. Evidence is found for a helicity flip amplitude at the level of $8 \pm 3\%$ of the non-flip amplitudes indicating a significant deviation from the prediction of s-channel helicity conservation.

Reference for elastic ρ production
1. H1 Collaboration, C. Adloff *et al*, DESY-99-010 / submitted to Eur.Phys.J. C