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A Search for Leptoquarks in ep Collisions at HERA

H1 Collaboration

Abstract

A search for scalar and vector leptoquarks coupling to first generation fermions is performed by the H1 experiment using the full HERA II $e^{\pm}p$ data, collected in the years 2003-2007. No significant evidence for the direct production of such particles is found in a data sample with a large transverse momentum final state electron or with large missing transverse momentum. The results of the present analysis are combined with those of the searches in the $e^{+}p$ and $e^{-}p$ data of the HERA I phase in order to obtain the respective mass spectra using the complete HERA I+II data.

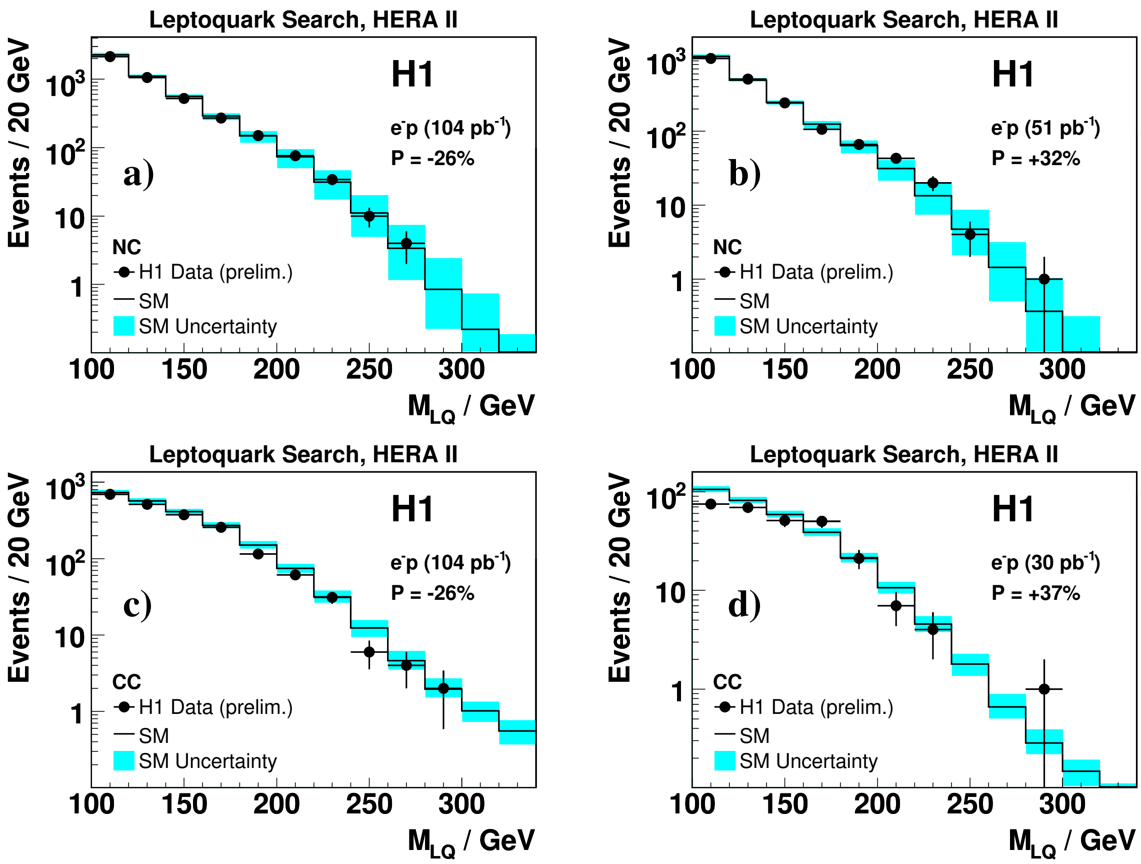

Figure 1: Mass spectra of the HERA II e^-p data for Neutral Current (a: left- and b: righthanded data) and Charged Current (c: left- and d: righthanded data) events in the H1 leptoquark analysis. The points are the data, which are compared to the SM expectation (histogram). The shaded band indicates the uncertainty on the SM expectation. The average polarisation of each data set is also indicated.

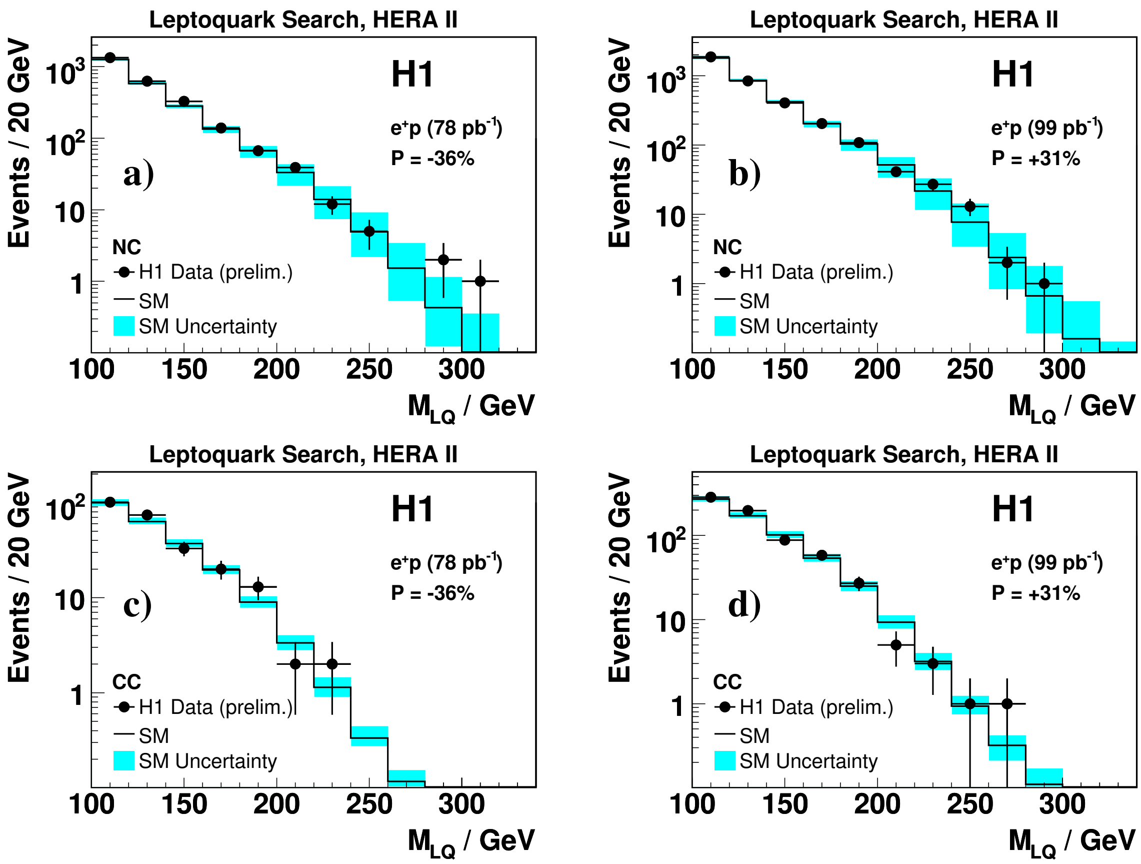

Figure 2: Mass spectra of the HERA II e^+p data for Neutral Current (a: left- and b: righthanded data) and Charged Current (c: left- and d: righthanded data) events in the H1 leptoquark analysis. The points are the data, which are compared to the SM expectation (histogram). The shaded band indicates the uncertainty on the SM expectation. The average polarisation of each data set is also indicated.

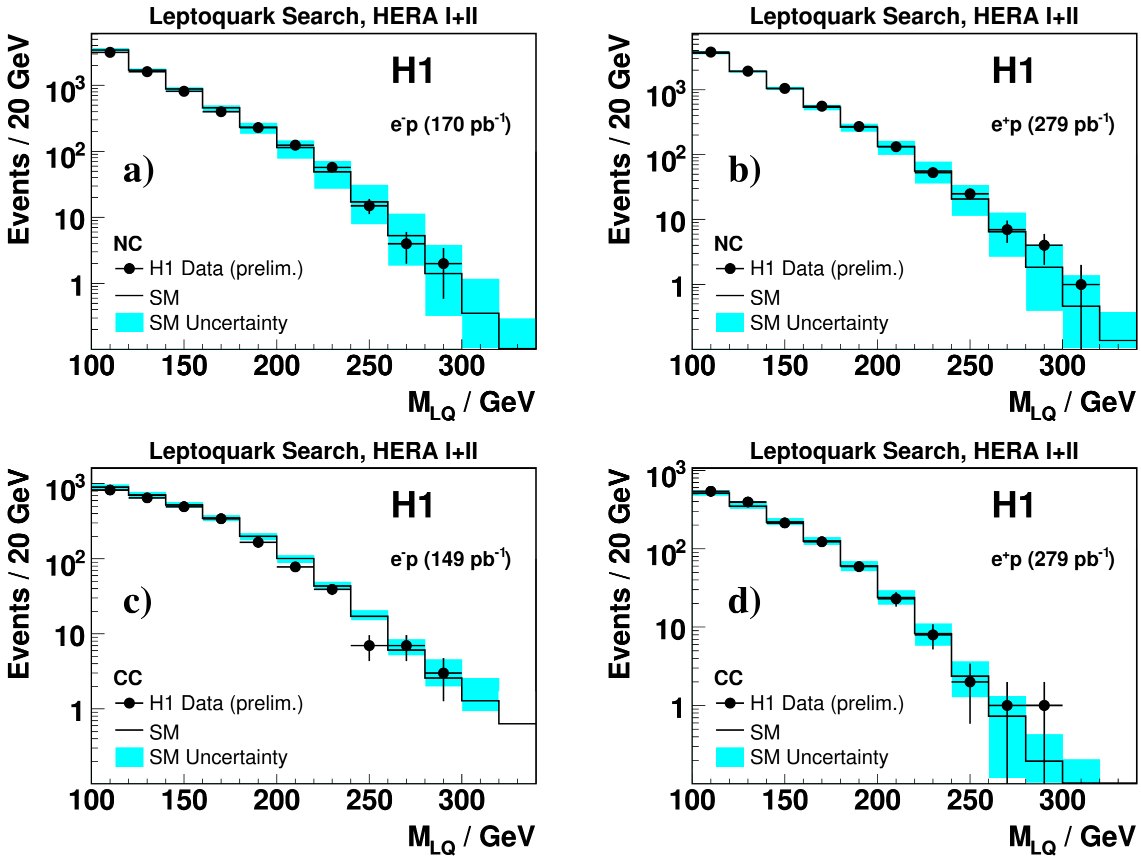

Figure 3: Mass spectra of the complete HERA I+II data for Neutral Current (a: e^-p data and b: e^+p data) and Charged Current (c: e^-p data and d: e^+p data) events in the H1 leptoquark analysis. The points are the data, which are compared to the SM expectation (histogram). The shaded band indicates the uncertainty on the SM expectation.

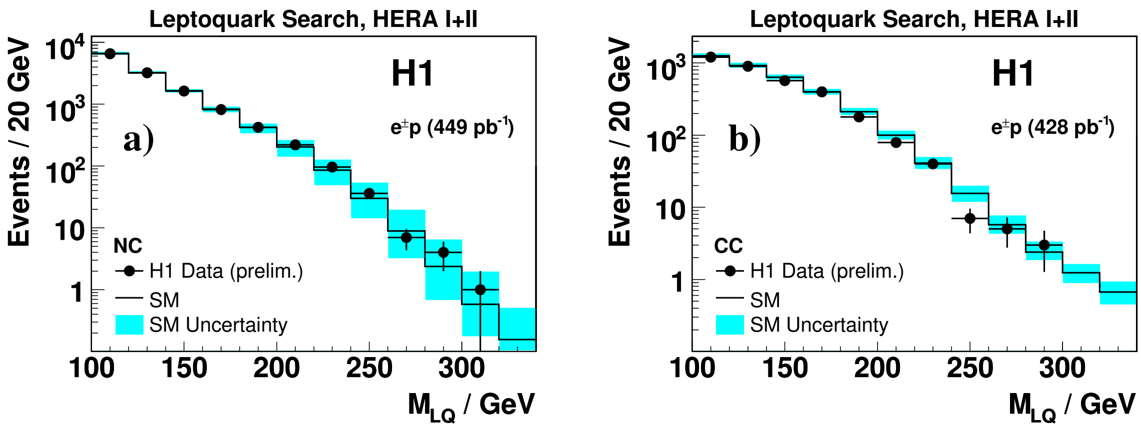

Figure 4: Mass spectra of the complete HERA I+II $e^{\pm}p$ data for Neutral Current (a) and Charged Current (b) events in the H1 leptoquark analysis. The points are the data, which are compared to the SM expectation (histogram). The shaded band indicates the uncertainty on the SM expectation.