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Combination and QCD Analysis of Charm Production Cross Section Measurements in Deep-Inelastic ep Scattering at HERA

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Measurements of open charm production cross sections in deep-inelastic ep scattering at HERA from the H1 and ZEUS Collaborations are combined. Reduced cross sections sigma_redˆ{c\bar{c}} for charm production are obtained in the kinematic range of photon virtuality 2.5 < Q2 < 2000 GeV2 and Bjorken scaling variable 0.00003 < x < 0.05. The combination method accounts for the correlations of the systematic uncertainties among the different data sets. The combined charm data together with the combined inclusive deep-inelastic scattering cross sections from HERA are used as input for a detailed NLO QCD analysis to study the influence of different heavy flavour schemes on the parton distribution functions. The optimal values of the charm mass as a parameter in these different schemes are obtained. The implications on the NLO predictions for Wˆ{\pm} and Z production cross sections at the LHC are investigated. Using the fixed flavour number scheme, the running mass of the charm quark is determined.

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