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Combination and QCD analysis of beauty and charm production cross section measurements in deep inelastic ep scattering at HERA

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Measurements of open beauty and charm production cross sections in deep inelastic ep scattering at HERA from the H1 and ZEUS Collaborations are combined. Reduced cross sections for beauty and charm production are obtained in the kinematic range of photon virtuality $2.5 \leq Q^2 \leq 2000 \text{ GeV}^2$ and Bjorken scaling variable $3 \times 10^{-5} \leq x_{Bj} \leq 5 \times 10^{-2}$. The combination method accounts for the correlations of the statistical and systematic uncertainties among the different data sets. The combined data are compared to perturbative QCD predictions and used together with the combined inclusive deep inelastic scattering cross sections from HERA in a next-to-leading order QCD analysis. The running charm and beauty quark masses are determined as $m_c(m_c) = 1.290_{-0.041}^{+0.046}(\text{exp/fit})_{-0.014}^{+0.062}(\text{model})_{-0.031}^{+0.007}(\text{param}) \text{ GeV}$ and $m_b(m_b) = 4.049_{-0.109}^{+0.104}(\text{exp/fit})_{-0.032}^{+0.090}(\text{model})_{-0.031}^{+0.001}(\text{param}) \text{ GeV}$.

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