

Charm and beauty production at an Electron-Ion Collider

An Electron-Ion Collider (EIC) with center-of-mass energy 20-100 GeV (eN) and luminosity $\sim 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ is being developed as a future facility for high-energy nuclear physics in the U.S. and worldwide. It would enable novel studies in charm and beauty physics over a wide kinematic range, using both deep-inelastic electroproduction and photoproduction, at $\sim 10^3$ times the luminosity of the HERA collider. Present R&D focuses

on using open charm and beauty production as a probe of the gluon density in the proton and in nuclei, especially in the region $x > 0.1$ [1]. Other possible physics applications include heavy quarkonium production and spectroscopy, as well as heavy baryon production. In this talk we summarize (a) the expected heavy quark production rates at EIC; (b) the possible methods of open charm/beauty reconstruction at EIC and their requirements; (c) prospects for using charm/beauty to constrain gluons at $x > 0.1$; (d) production of charm/beauty baryons in the target fragmentation region; (e) other applications of charm/beauty production at EIC.

Summary

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