

QED nuclear medium effects at EIC energies

We present the first calculation of quantum electrodynamics (QED) nuclear medium effects under the experimental conditions of future Electron-Ion Collider (EIC) experiments. While prior studies have predominantly focused on elastic scattering, our investigation extends to the more complex scenarios of inelastic processes within a nuclear medium. For lead nuclei, our findings suggest that the cross-section corrections due to QED nuclear medium effects could be substantial, reaching or exceeding the level of experimental precision. We estimate the dominant source of the uncertainties associated with our formalism by varying the scale of the atomic physics where the screening of the electric field of the nucleus happens. This calculation offers a path to a more precise extraction of the process-independent non-perturbative structure of nuclei.

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