

Nuclear shadowing in DIS for future electron-ion colliders

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We present the comprehensive study of shadowing in deep-inelastic scattering off nuclei in kinematical regions accessible by future experiments at electron-ion colliders.

The calculations of shadowing are performed within the color dipole formalism using a rigorous Green function technique. This allows incorporating naturally the effects of quantum coherence and color transparency, which are not consistently included in present calculations. We analyze as well the magnitude of gluon shadowing representing the shadowing correction coming from higher Fock states of the photon containing gluons. We present for the first time the theoretical uncertainties in predictions of shadowing using different models for the dipole cross section.

The magnitude of shadowing is confronted with results of standard parametrizations of nuclear parton distribution functions within the collinear QCD-parton model. Finally, our predictions for the nuclear shadowing are compared with available data, as well as they are presented for future measurements corresponding to planned experiments at electron-ion colliders.

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