

Weak structure functions in νl -N and νl -A scattering with nonperturbative and higher order perturbative QCD effects

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The effect of nonperturbative and higher order perturbative corrections to all the free nucleon structure functions in the deep inelastic scattering (DIS) of neutrinos on nucleon/nucleus is studied. The target mass correction and higher twist effects are incorporated following the works of Kretzer et al. and Dasgupta et al., respectively. The evaluation of the nucleon structure functions has been performed by using the Martin-Motylinski Harland-LangThorne 2014 parametrization of the parton distribution functions. The calculations have been performed at the next-to-leading order. The results for the nucleon/nuclear structure functions shall be presented. The various effects considered in this work are effective in the different regions of x and Q^2 , and quite important in the few GeV energy region. The numerical calculations for the ν -A deep inelastic scattering (DIS) process have been performed by incorporating the nuclear medium effects like Fermi motion, binding energy, nucleon correlations, mesonic contributions, shadowing, and antishadowing in several nuclear targets such as carbon, polystyrene scintillator, iron, and lead, which are being used in MINERA, and in argon nuclei, which is relevant for the ArgoNeuT and DUNE experiments.

Working group

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