

High-energy neutrino deeply inelastic scattering cross sections from 100 GeV to 1000 EeV

Saturday 29 April 2023 15:15 (15 minutes)

We present a state-of-the-art prediction for cross sections of neutrino deeply inelastic scattering (DIS) from nucleon at high neutrino energies, E_ν , from 100 GeV to 1000 EeV (10^{12} GeV). Our calculations are based on the latest CT18 NNLO parton distribution functions (PDFs) and their associated uncertainties. In order to make predictions for the highest energies, we extrapolate the PDFs to small x according to several procedures and assumptions, thus affecting the uncertainties at ultra-high E_ν ; we quantify the uncertainties corresponding to these choices. Similarly, we quantify the uncertainties introduced by the nuclear corrections which are required to evaluate neutrino-nuclear cross sections for neutrino telescopes. These results can be applied to currently-running astrophysical neutrino observatories, such as IceCube, as well as various future experiments which have been proposed.

Presenter: XIE, Keping (University of Pittsburgh)

Session Classification: Talks