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Argon spectral function implementation for LBNE/MicroBooNE

The neutrino-nucleus cross-section will be measured using Liquid Argon Time Projection Chamber (LArTPC) in MicroBooNE and long baseline neutrino experiment (LBNE) at Fermi Lab. This poster will discuss the nuclear model implementation based on the realistic Argon spectral function (SF) in the GENIE neutrino event generator. The SF can better describe the lepton-nucleus interaction and thus yields a more precise prediction of the cross-section than the relativistic Fermi Gas model (RFGM) by comparing to electron data. Besides improving the RFGM description in GENIE, our scheme involves a new prescription for Q^2 selection. That helps efficiently enforce the energy momentum conservation. Our simulated results are already validated through the comparison to electron data. They were obtained for a variety of target nuclei, ranging from carbon to argon, under the interested kinematic region where the QE scattering is the dominant reaction mechanism. We also analyze the influence of the adopted nuclear model on the determination of neutrino oscillation parameters.

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Track Classification: Long Baseline Oscillations