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Quasi-Elastic Lepton Nucleus Scattering and the Correlated Fermi Gas Model

Tuesday 14 May 2024 16:30 (15 minutes)

The study of neutrino-nucleus scattering processes is important for the success of a new generation of neutrino experiments such as DUNE and T2K. Quasielastic neutrino-nucleus scattering, which yields a final state consisting of a nucleon and charged lepton, makes up a large part of the total neutrino cross-section in neutrino experiments. A significant source of uncertainty in the cross-section comes from limitations in our knowledge of nuclear effects in the scattering process.

The observations of short-range correlated proton-neutron pairs in exclusive electron scattering experiments led to the proposal of the Correlated Fermi Gas nuclear model. This model is characterized by a depleted Fermi gas region and a correlated high-momentum tail. We present an analytic implementation of this model for electron-nucleus and neutrino-nucleus quasi-elastic scattering. Also, we compare separately the effects of nuclear models and electromagnetic and axial form factors on electron and neutrino scattering cross-section data.

Mini Symposia (Invited Talks Only)

Authors: CAREY, Sam (Wayne State University); Prof. BHATTACHARYA, Bhubanjyoti (Lawrence Technological University); PAZ, Gil

Presenter: CAREY, Sam (Wayne State University)

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