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Assessing the accuracy of the GENIE event generator with electron scattering data

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The accuracy of extracted neutrino oscillation parameters in accelerator-based neutrino experiments depends on the precision of neutrino-nucleus scattering models implemented in neutrino event generators. The goal of this study is to asses the accuracy of the GENIE event generator with electron scattering data. To do this we carry out a comparison of the charged-current quasielastic CCQE reduced cross sections of the semi-exclusive (l,l'p) lepton scattering process calculated within the models employed in the GENIE event generator with data measured in electron scattering on carbon targets. This comparison is based on the similarity of the reduced cross sections of neutrino and electron scattering up to Coulomb corrections. Irrespective of the type of interaction the reduced cross section identified with distorted nuclear spectral functions is determined mainly by intrinsic properties of the target and the ejected nucleon interaction with residual nucleus. This study includes GENIE's main models and Tokyo, Saclay, SLAC and JLab electron data sets in energy range 0.5 GeV - 2.5 GeV. Persistent disagreements between the GENIE predictions and electron scattering data for reduced cross sections is observed.

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