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Form factor and Model Dependence in Neutrino-Nucleus Cross Section Predictions

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The next generation of neutrino oscillation experiments require precise predictions of neutrino-nucleus cross sections as well as control over their uncertainties, including the contribution of model dependence to the overall error budget. To this end we compare two methods of computing $CC0\pi$ flux folded cross sections; an ab-initio method based on Greens Function Monte Carlo, and a Quantum Monte Carlo based SF with extended factorization scheme. Both models share the same underlying description of nuclear dynamics, but differ in their treatment of relativistic effects, interference terms, and the nuclear ground state. We compare these two models against flux folded differential cross sections from MiniBoone and T2K. This is the first comparison of the QMC based SF with neutrino scattering data. In addition we evaluate the effect of different parameterizations of the Axial form factor, including predictions from Lattice QCD.

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