

Recent Progress in Neutrino-Nucleus Scattering

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An updated version of the SuperScaling model – SuSAv2 – for the electroweak nuclear response has been recently developed. The model is based on the superscaling properties of electron scattering data and incorporates the main features of Relativistic Mean Field theory. Two-body vector and axial meson-exchange currents – MEC – are calculated in a fully relativistic framework with no numerical approximation.

The validation of the SuSA2-MEC model through comparison with a large set of electron scattering data – spanning energies from a few MeV to several GeV – will be illustrated. Predictions for neutrino and antineutrino scattering data will be shown and compared with data from several experiments (MiniBooNE, T2K, MINERvA, SciBooNE, NOMAD).

Various issues will be discussed, in particular the importance of relativistic effects in the kinematics relevant for modern neutrino experiments and the comparison between different approaches to the inclusion of two-body currents.

References

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- [2] I. Ruiz Simo, J.E. Amaro, M.B. Barbaro, A. De Pace, J.A. Caballero, T.W. Donnelly, “Relativistic model of 2p-2h meson exchange currents in (anti)neutrino scattering”, e-Print: arXiv:1604.08423 [nucl-th].