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The relevance of neutrino-nucleus interaction models in T2K and SuperKamiokande

The precise knowledge of neutrino oscillation properties requires an accurate description of neutrino-nucleus interactions, constituting one of the largest source of current systematics. Accordingly, the development and implementation of sophisticated neutrino interaction models in the MonteCarlo event generators employed in neutrino oscillation experiments plays an essential role. In this context, the so-called SuSAv2-MEC model, based on the Relativistic Mean Field theory, has recently proven its validity to analyze neutrino-nucleus scattering data in the kinematical region of interest for current and forthcoming neutrino oscillation experiments, being a promising candidate to be implemented in event generators in order to improve the oscillation analysis. This work presents the first steps towards the implementation of sophisticated microscopic nuclear models (SuSAv2, RMF) in the NEUT event generator and the analysis of the low energy and nuclear-medium effects for several nuclei (C, O, Ar) in comparison with recent experimental analyses.

Mini-abstract

Implementation of RMF models to reduce systematics and improve oscillation analysis in T2K and SK

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