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P3.036 **Modeling neutrino-nucleus scattering at kinematics relevant for accelerator-based neutrino-oscillation experiments**

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Both present and future generations of accelerator-based neutrino-oscillation experiments use nuclei as targets. Therefore, a good understanding of neutrino-nucleus processes, including nuclear effects, is essential to reduce systematic errors in the experimental analyses. Additionally, as monochromatic neutrino beams are not available, the theoretical models have to be able to describe all possible reaction channels in the wide energy region covered by the neutrino beams : quasielastic scattering, two-body current contributions, pion production, deep inelastic scattering, etc.

In recent years, the research activities of the Ghent group have focused on providing a consistent description of some of these mechanisms. We wish to present the current status of our investigations. We describe the low energy region with collective nuclear excitations and the quasielastic peak using a Hartree-Fock-CRPA (continuum random phase approximation) model that takes into account nuclear long-range correlations as well as hadronic final-state interactions. The two-body current mechanisms, which are especially important in the region between the quasielastic and the delta-resonance peak, are treated within the same mean-field based model. We consider the influence of nuclear short-range correlations on one- and two-nucleon knockout channels, some preliminary results for meson-exchange current contributions are also presented. Our description of intermediate-energy neutrino-nucleus scattering is completed by modelling neutrino-induced pion production. For that, we consider the dominant contribution from the decay of the delta resonance as well as other contributions required by chiral symmetry. Here, we work in a fully relativistic formalism with a refined treatment of nuclear effects.

First, our results are validated by a comparison with inclusive electron scattering data. Then, we compare our predictions with data from recent accelerator-based neutrino-oscillation experiments: MiniBooNE, T2K, and MINERvA.