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POSTER Modeling neutrino-nucleus interactions in the few-GeV regime

Detecting neutrinos and extracting the information they bring along is an ambitious task that requires a detailed understanding of neutrino-nucleus interactions over a broad energy range. Whereas the experimental observable is often an inclusive cross section, a careful study of exclusive cross sections is indispensable for a thorough understanding of these processes.

We present calculations for quasi-elastic neutrino-induced nucleon knockout reactions on atomic nuclei and neutrino-induced pion production reactions. In our models, final-state interactions are introduced using a relativistic multiple-scattering Glauber approximation (RMSGA) approach. For interactions at low incoming neutrino energies, long-range correlations are implemented by means of a continuum random phase approximation (CRPA) approach.

As neutrinos are the only particles interacting solely by means of the weak interaction, they can reveal information about e.g. the structure of nuclei or the strange quark content of the nucleon that is difficult to obtain otherwise. We investigated these effects and present results for a.o. the sensitivity of neutrino interactions to the influence of the nucleon's strange quark sea.

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