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Low-energy analysis of neutrino-nucleon scattering

Low energy interactions between neutrinos and nucleons have been investigated in manifestly relativistic baryon chiral perturbation theory. At low energies, where chiral perturbation theory is applicable, the total cross sections for the different reaction channels exhibit a sizable non-resonant contribution, which is not present in event generators of broad use in neutrino oscillation and cross section experiments such as GENIE and NuWro. The present study provides a well-founded low-energy benchmark for phenomenological models aiming at the description of neutrino interactions with nucleons in the broad kinematic range of interest for current and future neutrino-oscillation experiments.

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