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Tensions between theory and experiment on final states interaction with neutrinos

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Modeling neutrino final state interactions with target nuclei within neutrino detectors is an open research field. Experiments such as MINERvA, T2K and NOvA found discrepancies on their simulations with their data, which implies that the current theoretical models are not encoding the full physics of the interactions. In particular, long-baseline neutrino oscillation experiments are currently developing various analysis techniques to bridge the gap between theory and experiments through the tuning of the theoretical models, embedded in their simulations, to their data, emphasizing the regions of energies in which they operate. Further theoretical work is expected in the future to explain the findings of neutrino experiments on this regard. In this talk we summarize the latest analysis techniques coded in neutrino cross-section simulators used by some long-baseline neutrino oscillation experiments, focusing on the final state interactions tunings done over the GENIE 3.2 simulation.

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