Contribution ID: **36** Type: **not specified**

Neutrino-deuteron scattering in a multipole decomposition framework

Wednesday, 23 September 2020 11:40 (10 minutes)

Chiral effective field theory (EFT) provides nuclear interactions as well as electroweak currents constructed in a rigorous framework that allows systematic improvement and uncertainty quantification. Multipole decomposition of the chiral EFT current operators is an essential first step in calculating quasielastic neutrino cross sections using several state-of-the-art methods in nuclear structure theory that employ harmonic-oscillator-basis representation of the nuclear Hamiltonian. I will present our recent calculation of neutrino-induced dissociation of the deuteron at energies from threshold up to 150 MeV by employing chiral EFT potentials and currents in a multipole decomposition framework. Estimates of uncertainties due to nuclear structure and nucleon axial form factor will be discussed. Furthermore, by matching our low-energy chiral EFT results to those of pionless EFT, we provide new constraints for the counterterm $L_{1,A}$ that parameterizes the strength of the axial two-body current in this theory. Ongoing efforts to extend a similar approach to medium-mass nuclei will be discussed.

Primary author: Dr ACHARYA, Bijaya (Johannes Gutenberg University of Mainz)

Co-author: Dr BACCA, Sonia (Johannes Gutenberg University of Mainz)

Presenter: Dr ACHARYA, Bijaya (Johannes Gutenberg University of Mainz)

Session Classification: Contributed 10