

Neutrino-nucleus scattering from a quantum Monte Carlo perspective

Theoretical calculations of neutrino-nucleus scattering cross sections are critical for the success of the accelerator neutrino program, as experiments use nuclear targets in their detectors. I will present a nuclear quantum Monte Carlo protocol suitable to compute quasi-elastic lepton-nucleus inclusive scattering for moderate momentum transfer accurately. To tackle the high-momentum regime, I will discuss the development of an “extended factorization scheme” based on realistic spectral functions computed within quantum Monte Carlo that includes two-nucleon current and single-pion-production amplitudes. Finally, I will discuss their interplay with ACHILLES, a novel neutrino event generator we contribute to developing.

Primary author: LOVATO, Alessandro (Argonne National Laboratory & INFN - TIFPA)

Presenter: LOVATO, Alessandro (Argonne National Laboratory & INFN - TIFPA)

Track Classification: Electromagnetic and weak interactions