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Quasielastic Scattering Simulation off Mean Field Nucleons[1]
SAMUEL SOLOMON, JACKSON PYBUS, ANDREW DENNISTON, EFRAIN SEGARRA, AXEL SCHMIDT, OR HEN, Massachusetts Institute of Technology, HEN LAB TEAM — Quasielastic (QE) electron-nucleus scattering is a powerful probe for nuclear structure, revealing a distinction between nucleons in mean-field orbitals and those in high-momentum, short-range correlated (SRC) states. Despite being difficult to calculate using ab initio methods, QE cross sections can be estimated from nuclear spectral functions using Plane-Wave Impulse Approximations (PWIA). Recently, a novel approach called Generalized Contact Formalism has been successful in describing the limiting case of QE scattering from a nucleon in an SRC pair. To extend this method, I developed software to simulate QE scattering from a mean field nucleon based on ab initio spectral function calculations. This allows for independent comparison of scattering events between SRC and mean field nucleons, which are difficult to distinguish experimentally. I plan on using these comparisons to test if the observed missing mass offset in SRC pair break-up reactions can be understood from conventional nuclear physics or is a signature of a previously unobserved 30 MeV force-carrying boson.

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Samuel Solomon
Massachusetts Institute of Technology

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