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Investigation of electroweak processes in light nuclei with Chiral Effective Field Theory GARRETT KING, SAORI PASTORE, MARIA PIARULLI, Washington University, St. Louis — Understanding electroweak interactions in nuclei is crucial for future fundamental physics investigations, such as neutrinoless double beta decay experiments and long-baseline experiments measuring neutrino oscillation parameters. In this work, we present *ab initio* calculations of low-energy electroweak processes in light nuclei for vanishing and moderate momentum transfer using variational and Green's Function Monte Carlo methods. Calculations of nuclear matrix elements employ the Norfolk potential, a high-quality local chiral interaction containing two- (NN) and three-body ($3N$) forces. Employing one- and two-body axial currents consistent with the Norfolk potential, we calculate Gamow-Teller (GT) reduced matrix elements and one- and two-body GT transition densities for $A \leq 10$ nuclei. These studies provide a validation of nuclear many-body correlations and currents entering *ab initio* calculations and demonstrate the behavior of individual contributions to the axial current in the limit of vanishing momentum transfer. Additionally, we calculate muon capture rates, allowing us to validate contributions to the electroweak charge and current operators at momentum transfers on the order of the muon mass.

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