GFMC CALCULATIONS OF ELECTROMAGNETIC MOMENTS AND TRANSITIONS IN $A \leq 9$ NUCLEI INCLUDING MESON-EXCHANGE CURRENTS

S. Pastore[1], Steven C. Pieper[1], R. Schiavilla[2,3], R. B. Wiringa[1]

[1] *Argonne National Laboratory, Argonne, IL 60439, USA*

[2] *Theory Center, Jefferson Laboratory, Newport News, VA 23606, USA*

[3] *Department of Physics, Old Dominion University, Norfolk, VA 23529, USA*

Green's function Monte Carlo (GFMC) calculations of electromagnetic moments and transitions, including two-body meson-exchange current (MEC) contributions are reported for $A \leq 9$ nuclei. The realistic Argonne v_{18} two-nucleon and Illinois-7 three-nucleon potentials are used to generate the nuclear wave functions [1]. Two-body electromagnetic current operators have been derived in both a standard nuclear physics approach [2] and a new chiral effective field theory (χEFT) formulation with pions and nucleons including up to one-loop corrections [3]. The χEFT currents have been tested in few-nucleon systems, and they provide a satisfactory description for the cross sections of thermal neutron radiative captures on the deuteron and ^{3}He.

Results will be presented for ^{7,8,9}Li, ^{7,9}Be, ^{8}B and ^{9}C, including charge radii, magnetic and quadrupole moments, and $M1$ and $E2$ transitions. The two-body MEC contributions provide significant corrections to both the magnetic moments and $M1$ transitions.

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