

Abstract Submitted  
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**Ab Initio Calculations of Electroweak Matrix Elements.**<sup>1</sup>  
MUSLEMA PERVIN, ROBERT WIRINGA, STEVEN PIEPER, KENNETH NOLLETT, Argonne National Laboratory — The variational Monte Carlo (VMC) and Green's function Monte Carlo (GFMC) techniques are powerful tools for calculating properties of light nuclei. These methods in combination with the Argonne  $v_{18}$  (AV18) two-nucleon and Illinois-2 (IL2) three-nucleon potentials, reproduce the energies of many bound and narrow states in nuclei up to  $A=12$ . They have also been applied to calculate properties beyond the structures of nuclei, for example, radiative capture cross sections and electroweak matrix elements. We are now exploring some nuclear transitions, particularly electromagnetic transition strengths and nuclear beta decay rates, with the GFMC technique using the AV18 + IL2 potential for nuclei with  $A=6$  to 8. A few of the transitions have previously been calculated using the more approximate VMC technique but with an older potential. However, GFMC wave functions are better approximations to the true wave functions, hence GFMC results for these transitions should be more reliable.

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