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Survey of ab initio Gamow-Teller observables in the *p* shell[1]
PATRICK J. FASANO, ZHOU ZHOU, MARK A. CAPRIO, University of Notre Dame, PIETER MARIS, JAMES P. VARY, Iowa State University — *Ab initio* nuclear theory strives to make quantitative predictions of nuclear observables, such as Fermi and Gamow-Teller strengths. The no-core configuration interaction (NCCI) method solves the quantum many-body problem, starting with the internucleon interaction, and gives wave functions representing approximate eigenstates of the nuclear Hamiltonian. These wave functions can then be used to evaluate transition matrix elements. However, the calculated results can depend heavily on the choice of single-particle basis and the choice of truncation needed to solve the problem numerically. We therefore survey impulse-approximation weak (Fermi and Gamow-Teller) transition observables in the p-shell and explore the convergence behavior of both the individual transition matrix elements and the mixing ratios. This in turn will serve as a baseline when considering corrections to the operator arising from meson-exchange current (MEC) contributions derived in chiral effective field theory (χEFT).

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