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Operator evolution in the three-body space via the similarity renormalization group[1] MICAH SCHUSTER, San Diego State University, SOFIA QUAGLIONI, Lawrence Livermore National Laboratory, CALVIN JOHNSON, San Diego State University, ERIC JURGENSON, Lawrence Livermore National Laboratory, PETR NAVRATIL, TRIUMF — Performing quantitative calculations of nuclear observables in terms of nucleons interacting through two- and three-nucleon forces is a guiding principle of *ab initio* nuclear theory. Computationally, this is complicated by the large model spaces needed to reach convergence in many-body approaches, such as the no-core shell model (NCSM). In recent years, the similarity renormalization group (SRG) has provided a powerful tool to soften interactions for *ab initio* structure calculations, thus leading to convergence within smaller model spaces. SRG has been very successful when applied to the Hamiltonian of the nuclear system. However, when computing observables other than spectra, one must evolve the relevant operators using the same transformation that was applied to the Hamiltonian. Here we compute the root mean square (RMS) radius of ^{3}H to show that evolving the $\hat{r}^2$ operator in the three-body space, thus including two- and three-body SRG induced terms, will yield an exactly unitary transformation. We then extend our calculations to ^{4}He and compute the RMS radius and total strength of the dipole transition using operators evolved in the three-body space.

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