

Abstract Submitted
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In-Medium Similarity Renormalization Group with NN and 3N Interactions¹ HEIKO HERGERT, Ohio State University — The primary use of the Similarity Renormalization Group (SRG) in nuclear physics is the derivation of effective interactions from underlying realistic vacuum NN and 3N interactions, which have a greatly improved convergence behavior in nuclear many-body calculations. The SRG flow equation formalism has much wider applications, though. In the In-Medium SRG the Hamiltonian is evolved directly in the A-body system (i.e., at finite density). By a suitable choice of generator the ground state is decoupled from particle-hole excitations, and the IMSRG can be considered an ab initio technique for solving the many-body problem. The modest computational effort makes calculations for medium-mass and heavy nuclei feasible. I will give a brief overview of the method, present results for closed-shell nuclei with NN and 3N interactions, and discuss the progress in our effort to generalize the IM-SRG formalism for arbitrary reference states, with the aim of extending our calculations to open-shell nuclei.

References: K. Tsukiyama, S. Bogner, and A. Schwenk, Phys. Rev. Lett. 106, 222502 (2011)

S. Bogner, R. Furnstahl, and A. Schwenk, Prog. Part. Nucl. Phys. 65, 94 (2010)

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