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Ab-Initio Excited States from the In-Medium Similarity Renormalization Group NATHAN PARZUCHOWSKI, SCOTT BOGNER, HEIKO HERGERT, Michigan State University — The recently developed In-Medium Similarity Renormalization Group (IM-SRG) has had great success in the direct ab-initio calculation of scalar observables of the ground states of medium mass nuclei. To extend these calculations to excited states and response, we employ equations-of-motion (EOM) methods, which make approximations to the overall structure of excited states. We obtain an effective Hamiltonian by solving a set of IM-SRG flow equations specific to these approximations. Promising results are obtained for low-lying excited states in closed-shell nuclei. These calculations provide a simple framework for the calculation of electromagnetic and weak transition strengths, and can be extended straightforwardly to open-shell nuclei using a multi-reference framework.

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