

Abstract Submitted
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Spectra of Heavy Nuclei in the Shell Model Monte Carlo Method¹

SOHAN VARTAK, YORAM ALHASSID, Yale University, MARCO BONETT-MATIZ, University of Bridgeport — The shell model Monte Carlo (SMMC) method is a powerful technique for calculating the thermal and ground-state properties of nuclei in model spaces that are many orders of magnitude larger than those that can be treated in conventional diagonalization methods. However, extracting information about individual excited states poses a challenge in SMMC. Recently, a method was developed to extract the energies of several excited states for given values of the spin and parity [1]. The method is based on solving a generalized eigenvalue problem that is satisfied by the imaginary-time response matrices of one-body densities. We are applying this method to calculate the energies of low-lying collective states in chains of rare-earth isotopes that describe a crossover from vibrational to rotational collectivity. [1] Y. Alhassid, M. Bonett-Matiz and C.N. Gilbreth, to be published (2019).

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