

Abstract Submitted
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High-Performance Algorithm for Calculating Energy Level Densities in Many-Body Systems ROMAN SENKOV, La Guardia Comm Coll, VLADIMIR ZELEVINSKY, NSCL, Michigan State University — An algorithm using methods of statistical spectroscopy was developed for calculating level densities in quantum many-body systems. The approach is based on the ideas of complexity and quantum chaos and does not require diagonalization of large matrices. The algorithm was applied to the calculation of nuclear level densities in the proton-neutron formalism. This method was further improved to remove the contributions of spurious states. We show the results for some medium-mass nuclei and compare them with the exact shell-model level density. The method can be also used to extract with good precision the ground state energy for very large shell-model cases. The algorithm can be applied to other many-body systems with strong interaction.

Roman Senkov
La Guardia Comm Coll

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