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Nuclear energy spectra calculated from derived single particle energies

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Abstract content
 (Max 300 words)

The usual approach to shell-model calculation is to use experimentally extracted single-particle (s.p) energies as a part of an input to the shell model for nuclear energy level calculation. A set of mass dependent s.p energies for sd-shell calculations derived from realistic forces using a set of two-body correlation functions with ^{16}O taken as a closed-shell core is used in the present work to determine the energy spectra of nuclei in the lower half of the sd-shell. It is observed that the calculated spectra using the derived s.p energies are in good agreement when compared with those obtained using experimentally extracted s.p energies. However, both of them showed compression behavior as compared to the experimental spectra of these nuclei. These results demonstrate that shell model calculations can be done quite successfully with the s.p energies derived theoretically.

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