

Deformed shell model applications to weak interaction processes

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The deformed shell model (DSM) was successful in describing many spectroscopic properties of medium mass nuclei like energy spectra, electromagnetic transition probabilities, band crossings, shape coexistence etc. [1]. In the last 15 years, this model has been employed successfully for the nuclear structure parts in the description of many weak interaction processes such as double beta decay, dark matter detection rates and neutrino-nucleus scattering cross sections. In this contribution, besides giving an overview of the past work, we will present results for: (i) 2ν double beta decay half-life of ^{100}Mo obtained using DSM with a realistic effective interaction; (ii) event detection rates for the WIMP-nucleus scattering with ^{127}I example; (iii) neutral-current neutrino scattering on Mo isotopes with ^{96}Mo example.

[1] V.K.B. Kota and R. Sahu, Structure of Medium Mass Nuclei: Deformed Shell Model and Spin-Isospin Interacting Boson Model (CRC Press, Taylor and Francis group, Florida, 2017).

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