Nuclear structure calculations of the even-even Mo isotopes in the context of QRPA method

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The even-even Mo isotopes play a significant role in supernova evolution phenomena and are used as targets in the MOON neutrino experiment in Japan. A systematic study of the nuclear structure of the aforementioned isotopes is presented and discussed. The nuclear wave functions for the initial and final nuclear states are constructed in the context of the quasi-particle random phase approximation (QRPA) tested on the reproducibility of the low-lying energy spectrum (up to about 5 MeV) of the studied nuclei. The response of these detectors to supernova neutrino is also studied, by exploiting the above results and utilizing the folding procedure assuming a two parameter Fermi-Dirac distribution for the supernova neutrino energy-spectra.