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Low-energy spectra of nobelium isotopes: Skyrme random-phase-approximation analysis

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The low-energy multipole spectrum in isotopes 250-260No is investigated in the framework of fully self-consistent Quasiparticle-Random-Phase-Approximation (QRPA) method with Skyrme forces [1,2]. The representative set of Skyrme parametrizations (SLy5, SLy6, SkM* and SVbas) is applied. The main attention is paid to nuclei 252No and 254No, where we have most of the experimental spectroscopic information [3,4]. In addition to low-energy one-phonon collective states (lm=20,22,30,31,32) and their rotational band, the isomeric states are inspected. In general, a good agreement with the experimental data is obtained. Some K-isomers in these nuclei are inspected. It is shown that, in the chain 250–260No, features of 252No and 254No exhibit essential irregularities caused by a shell gap in the neutron single-particle spectra and corresponding break of the neutron pairing. The low-energy pairing-vibrational Kπ = 0+ state is predicted.

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