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Structure of low-lying quadrupole states of polonium isotopes in the vicinity of 208Pb

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The nuclei with few proton and neutron particles (holes) away from doubly-magic nuclei are the simplest nuclear systems in which both nuclear collectivity and the two-fluid nature of the nuclear matter can simultaneous be manifested. The relatively small number of valence particles (holes) allows the low-lying collective states in these nuclei to be described in the shell-model framework. The comparison of shell-model results with experimental data reveals the microscopic structure of these states and allows one to identify and, eventually, adjust the two-body matrix elements of the effective shell-model interaction which give rise to the configuration mixing responsible for the observed properties of the collective states.

The nuclei in the vicinity of the doubly magic nucleus 208Pb have attracted significant interest in last several years. In the present contribution I will present the results from several lifetime measurements aimed to the properties of low-lying quadrupole states of 208, 210, 212Po. The results will be discussed in the shell-model framework with a focus on the onset of quadrupole collectivity and on the properties of low-lying quadrupole isovector excitations.

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