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

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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 simultaneously 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 ^{208}Pb 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 , ^{212}Po . 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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