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Search for low-lying octupole-isovector excitations

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Two-component quantum systems develop fundamental modes in terms of in-phase and out-of phase motion of the subsystems. For the nuclear many-body system the framework of the proton-neutron Interacting Boson Approximation (IBA-2) predicted the latter type of excitations as so-called mixed symmetry states. The experimental fingerprint is a strong M1 transition to the proton-neutron symmetric coupled state, which is usually the lowest-lying state for a given spin and parity combination, and a weakly collective decay to the ground state. In this contribution results from ^{95}Mo(n,γ) and ^{143}Nd(n,γ) experiments employing the EXILL setup are reported. These measurements aimed to confirm candidates for low-lying octupole isovector (mixed-symmetry) states by measuring the relative intensity and multipole-mixing ratio in the crucial decay to the first 3^- level. Furthermore, for ^{144}Nd the lifetime of the candidate was remeasured using GAMS. In the talk the resulting experimental picture will be presented and for ^{96}Mo an alternative interpretation for the observed M1 strength given.

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