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Structural Evolution and Octupole Correlations in Transitional Nuclei

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The atomic nucleus is a fundamental and unique laboratory of nature for investigating the relationships among the fundamental symmetries. Exploring the relations between these symmetries is one of the major objectives of present-day researches. The nucleon-nucleon interactions inside the nucleus play a crucial role in the occurrence of various exotic phenomena like shape coexistence, γ-vibrational band, multi-phonon bands, back-bending, octupole vibration, octupole deformation, band termination, etc. Due to advancements in detection systems like high-resolution gamma detector arrays with large efficiency, it is now possible to study these exotic features exhibited by atomic nucleus. Recently, the high-spin states of the 73Br nucleus have been populated via the 50Cr(28Si, αp)73Br fusion evaporation reaction with a beam energy of 90 MeV. The deexciting gamma rays were detected using the Indian National Gamma Array (INGA) facility at Inter-University Accelerator Center (IUAC), New Delhi [1]. The half-life τ1/2 = 52(2) ns of isomeric 9/2+ state is determined using the intensity variation method. This lifetime is used to determine the magnitude of monopole transition strength ρ2(E0), which provides evidence for the shape coexistence at low spin states in odd mass 73Br nucleus. In addition, two new interconnecting enhanced E1 transitions between positive and negative parity yrast band have been added, which provides evidence for octupole correlation in ground state configuration. The lifetime of high spin states has also been measured using the Doppler-shift attenuation method (DSAM) for both positive and negative parity bands in 73Br nucleus. The observed transitional quadrupole moments decreases with increasing spin for these bands. The experimental observations have been interpreted in terms of the cranked Nilsson-Strutinsky model and total Routhian surface calculations, providing evidence for band termination at higher spin [2].

REFERENCES

[1] S. Muralithar et al., Nucl. Instrum. Methods Phys. Res.Sect. A 622, 281 (2010).

[2] S. Bhattacharya et al., Phys. Rev. C 100 014315 (2019).

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