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High spin states in oblate-deformed, A~200 Hg isotopes

Content :

Mercury isotopes in the A~190-200 region are host to a variety of particle-rotor coupling mechanisms leading to the generation of high spin states. In the present work, we report on the spectroscopic study of decoupled and semi-decoupled bands in 197Hg and 199Hg isotopes. High spin states in these nuclei were populated using multi-nucleon transfer reactions between a 1450-MeV 209Bi beam and a 197Au target and the GAMMASPHERE facility at ANL, USA was utilized. In 199Hg, a three-quasiparticle structure after the BC crossing in the decoupled band has been observed for the first time in this work. Semi-decoupled structures have been extended in both 197,199Hg. A systematic study of structure across Hg isotopes in this mass region reveals the effect of the N=120 subshell gap in 199Hg and 200Hg. Cranking calculations are in agreement with the band crossing frequency and aligned angular momentum observed for the decoupled band in both odd-A isotopes. Potential energy surface calculations suggest that the shape of nucleus changes from moderately oblate near the 13/2+ bandhead to weakly-deformed triaxial at high spin.

Primary authors : Dr. NEGI, Dinesh (Centre for Excellence in Basic Sciences, Mumbai, India)

Co-authors :

Presenter : Dr. NEGI, Dinesh (Centre for Excellence in Basic Sciences, Mumbai, India)

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