

Frontiers in Gamma Ray Spectroscopy

FIG18

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High spin states in oblate-deformed, $A \sim 200$ Hg isotopes

Content :

Mercury isotopes in the $A \sim 190$ -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 ^{197}Hg and ^{199}Hg isotopes. High spin states in these nuclei were populated using multi-nucleon transfer reactions between a 1450-MeV ^{209}Bi beam and a ^{197}Au target and the GAMMASPHERE facility at ANL, USA was utilized. In ^{199}Hg , 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 $^{197},^{199}\text{Hg}$. A systematic study of structure across Hg isotopes in this mass region reveals the effect of the $N=120$ subshell gap in ^{199}Hg and ^{200}Hg . 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.

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