

Dipole Bands in ^{196}Hg

J J Lawrie¹, E A Lawrie¹, B Msezane^{1,2}, M Benatar^{1,3}, M Federke³, G K Mabala^{1,3}, S M Mullins¹, K P Mutshena^{1,3}, N J Ncapayi^{1,4}, R T Newman¹, J F Sharpey-Schafer¹, F D Smit¹, P Vymers^{1,4}

¹iThemba LABS, PO Box 722, Somerset West 7129, South Africa

²Department of Physics and Engineering, University of Zululand, Private Bag X1001, Kwadlangezwa 3886, South Africa

³Physics Department, University of Cape Town, Rondebosch 7700, South Africa

⁴Department of Physics, University of the Western Cape, Private Bag X17, Bellville 7535, South Africa

In previous studies dipole bands were observed in a number of even Hg isotopes, including ^{196}Hg where one dipole band was found [1]. In an experiment at iThemba LABS we observed both this and a second dipole band in ^{196}Hg and could make an unambiguous spin and parity assignments from DCO and polarization measurements.

The experiment was performed using the AFRODITE array that consisted of 7 suppressed clover detectors and 7 segmented planar Ge detectors. ^{196}Hg was populated in the $^{194}\text{Pt}(\alpha, n)$ reaction at 65 MeV using a thin (0.2 mg/cm²) target. The decay scheme obtained from a study of γ - γ coincidences generally confirms and extends the level scheme reported by Mehta et al [2]. We extended the even spin negative parity structure beyond the band crossing and up to spin 24⁻. We also observed the dipole band reported by Cederwall et al [1], and managed to establish two decay paths out of this band, both to negative parity bands, thereby fixing the excitation energy, spin and parity (-) of this dipole band. In addition we observe a second dipole band that extends both above and below previously observed levels at 5351, 5617 and 5860 keV [2]. DCO and polarization measurements on the transitions that depopulate this band towards a negative parity band fix the spin and parity (+).

A discussion on possible configurations as well as a comparison with dipole bands in $^{192,194}\text{Hg}$ will be presented.

[1] B. Cederwall *et al.*, Phys. Rev. C **7**, R2443 (1993).

[2] D. Mehta *et al.*, Z. Phys. A **339**, 317 (1991).