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Four-, Six- and Eight-quasiparticle Isomers in ^{174}Lu F.G. KONDEV, I. AHMAD, M.P. CARPENTER, R.V.F. JANSSENS, T. LAURITSEN, C.J. LISTER, D. SEWERYNIAK, Argonne National Laboratory, G.D. DRACOULIS, G.J. LANE, A.P. BYRNE, T. KIBEDI, Australian National University, P. CHOWDHURY, S.K. TANDEL, University of Massachusetts Lowell — We report on new studies of ^{174}Lu using a ^{136}Xe beam from the ATLAS accelerator at Argonne National Laboratory that was incident on targets of natural Lu and enriched (to 47%) ^{176}Lu. The targets were 6 mg/cm^2 in thickness with 25 mg/cm^2 of Au backing. The beam was pulsed approximately 1 ns on/825 ns off at energies of 6 MeV per nucleon. The recoils were stopped at the target position in the focus of the Gammasphere spectrometer, comprised for this experiment of 96 Compton-suppressed Ge detectors. Several high-K isomers were discovered in ^{174}Lu and their structure characterized, including $K^\pi=13^+$ (τ=280 (25) ns), 14^- (τ=55 (6) ns), (21^+) (τ=140 (15) ns) and (26^-) (τ=350 (28) ns). The 13^+ isomer was found to decay to both low-K ($K^\pi=0^+$) and high-K ($K^\pi=7^+$) states originating from couplings of the π 7/2[404] and ν 7/2[633] orbitals. The path via the $K^\pi=0^+$ band cannot be explained through conventional Coriolis mixings and the accidental mixing scenario between the isomer and a nearby collective level was invoked [1]. Details of these measurements will be presented, together with a comparison with predictions from multi-quasiparticle calculations.

[1] G.D. Dracoulis et al., submitted to Phys. Rev. Lett.

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