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Delayed nucleon alignment and search for prolate-to-oblate shape transition in ^{180}Hf at high spins* U.S. TANDEL, P. CHOWDHURY, S.K. TANDEL, S. SHEPPARD, U. Massachusetts Lowell, D. CLINE, C.Y. WU, U. Rochester, M.P. CARPENTER, R.V.F. JANSSENS, T.L. KHOO, T. LAURITSEN, C.J. LISTER, D. SEWERYNIAK, S. ZHU, Argonne Natl. Lab. — Early calculations predict a giant backbend in ^{180}Hf at I$\approx 26\hbar$ due to a crossing of two bands with different intrinsic shapes [1]. More recent cranking calculations [2,3] predict that oblate collective rotational states coexist with prolate ones in neutron-rich Hf nuclei, with the oblate becoming yrast at higher spins. The first nucleon alignment in ^{180}Hf, predicted at $\hbar\omega\approx 0.35$ MeV, was not observed in recent studies up to the $\hbar\omega\approx 0.43$ MeV [3]. In the present work, high spin states in ^{180}Hf were populated by inelastic excitation, with a 1300 MeV ^{180}Hf beam from the ATLAS accelerator at Argonne incident on a thin ^{232}Th target. The recoiling beam- and target-like nuclei were identified using the position-sensitive detector CHICO, which allowed event-by-event Doppler correction for the γ-rays emitted in flight by the recoiling nuclei and detected with the Gammasphere array. The extended level scheme of ^{180}Hf will be discussed in the context of the predicted alignments and shape changes. [1] R.R. Hilton and H.J. Mang, Phys. Rev. Lett. 43, 1979 (1979). [2] F.R. Xu et al., Phys. Rev. C62, 014301 (2000). [3] E. Ngijoi-Yogo, Ph.D. thesis, U.Mass. Lowell (2004)
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