Abstract Submitted for the DNP12 Meeting of The American Physical Society

Measurement of spin and parity of high spin rotational bands and the de-orientation effect in ¹⁷⁸Hf CHENGZHE ZHOU, University of Rochester, Rochester, NY 14627, USA, DOUGLAS CLINE, University of Rochester, ADAM HAYES, University of Rochester, Rochester, NY 14627, USA, CHICO-GAMMASPHERE COLLABORATION — Coulomb-excited rotational bands including the high K-isomer K=16+ ($\tau_{\frac{1}{2}}$ =31yr), have been populated in ¹⁷⁸Hf. The excitation mechanism, which requires 14 times K-forbidden transitions from the ground state band, is not understood. A 0.5 mg/cm^2 ²⁰⁸Pb target was bombarded by a ¹⁷⁸Hf beam at 985 MeV to investigate how the 16+ isomer is Coulomb-excited. Particles in coincidence with γ -rays were detected by CHICO and Gammasphere. Several new bands, including an a-band and t-band, were seen to high spins. These could contribute to the population of the K=16+ band. The spins, parities, as well as the mixing ratios of decaying transitions (E2/M1 or E1/E3), were deduced for the a-band and t-band based on the particle- γ angular correlation. The Coulomb excitation code GOSIA was used to fit to the experiment data. In this experiment, the ground-state band angular distribution of E2 decays was accurately reproduced by GOSIA. Best χ^2 fits of γ - γ angular correlation led to the assignment of positive parity for both the a-band and t-band. The spin assignments of both bands were confirmed with reasonable measurements on the mixing ratio of their decaying transitions to the ground state band.

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