# SEARCH FOR WOBBLING EXCITATIONS IN Hf NUCLEI: ARE THE TSD BANDS TRIAXIAL?*

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Evidence for stable triaxial deformation was recently observed in $^{163}$Lu [1] and other Z=71 nuclei. A family of superdeformed sequences was identified that has properties consistent with "wobbling" excitations, which are unique to a rotating triaxial nucleus. Thus, these structures are denoted as triaxial superdeformed bands (TSD). A family of four proposed superdeformed bands was also identified in $^{174}$Hf [2], and Ultimate Cranker (UC) calculations suggested they should also be triaxial. In order to verify this assertion, two GAMMASPHERE experiments were recently performed. First, the lifetimes of the superdeformed structures in $^{174}$Hf were measured using the Doppler-shift attenuation method. Large deformation ($Q_t$ $\sim$ 13.5 $e$b) was confirmed; however, the measured quadrupole moments are larger than the UC predictions ($\sim$9.5 $e$b). Second, a high-statistics experiment was performed to search for linking transitions between the TSD bands, which is characteristic of wobbling sequences. Despite the enhanced data (with respect to Ref. [2]), no linking transitions were found. However, three new superdeformed sequences in $^{174}$Hf were observed, and a single superdeformed band was found in $^{173}$Hf. The results of these two experiments, along with the observation of a superdeformed band in $^{175}$Hf [3] (which has known spins), reveal that the superdeformed bands in Hf nuclei are significantly different from those observed in the neighboring Lu isotopes. Whether stable triaxiality exists in the Hf isotopes will be discussed in terms of the new experimental information, as well as the possible consequences for the interpretation of the UC calculations. Answering these questions may be an important step toward a better understanding of the necessary conditions for triaxiality.

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