INVESTIGATION OF ANTI-MAGNETIC ROTATION IN ^{101}Pd*

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"Magnetic rotation" has been a topic of great interest and activity in nuclear structure in the past few years. In analogy with "ferromagnetism" and "antiferromagnetism", "antimagnetic rotation" was proposed by Frauendorf some time ago [1,2]. Experimentally, two cases in the A∼100 region have been observed and proposed as examples of "antimagnetic rotation"[3,4]. Considered as being composed of two systems of the magnetic type, the antimagnetic rotational bands appear as a regular cascade of E2 transitions in nuclei with very small deformation ($\varepsilon \leq 0.15$).

High-spin states in the nucleus ^{101}Pd have been studied with GAMMASPHERE at the ATLAS facility at ANL. The level scheme of ^{101}Pd has been considerably extended. A cascade of four "rotational-band-like" transitions was observed in this nucleus. This cascade exhibits the anticipated regular increase of transition energies with spin, and a smooth variation of the associated $\Im^{(1)}$ and $\Im^{(2)}$ moments of inertia with frequency. The configuration of the band is proposed to be $\pi(g_{9/2})^{-4}_{12} \otimes \nu(h_{11/2})^2_{11/2}(g_{7/2}d_{5/2})^3_{15/2}$. Its antimagnetic rotational nature has been inferred from a limited lifetime measurement which was carried out in a manner similar to that used in the case of ^{100}Pd in Ref. [3]. The limits on the lifetimes are such that they indicate small deformation. This observation, combined with the rotational character and the very large estimated $\Im^{(2)}/B(E2)$ ratios ($\sim$ 100 times larger than those of a well-deformed collective rotor) are consistent with expectations for an antimagnetic rotational band.

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