

Abstract Submitted  
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**Crystal electric field excitations in quasicrystal approximant  $\text{TbCd}_6$  studied by inelastic neutron scattering**<sup>1</sup> PINAKI DAS, R. FLINT, T. KONG, P.C. CANFIELD, A. KREYSSIG, A.I. GOLDMAN, Ames Laboratory, Iowa State Univ., USA, M. DE BOISSIEU, P.- F. LORY, G. BEUTIER, SIMap, Grenoble-INP, France, T. HIROTO, Tokyo Univ. of Science, Japan — All of the known quasicrystals with local moments exhibit frustration and spin glass-like behavior at low temperature. The onset of the spin freezing temperature is believed to be affected by the crystal electric field (CEF) splitting of the local moments. The quasicrystal approximant  $\text{TbCd}_6$  and its related icosahedral quasicrystal phase, i-Tb-Cd, form a set of model systems to explore how magnetism evolves from a conventional lattice (approximant phase) to an aperiodic quasicrystal. Though  $\text{TbCd}_6$  shows long-range antiferromagnetic ordering ( $T_N = 24$  K), only spin glass like behavior is observed in i-Tb-Cd with a spin freezing temperature of  $T_F = 6$  K. To investigate further, we have performed inelastic neutron scattering measurements on powder samples of  $\text{TbCd}_6$  and observed two distinct CEF excitations at low energies which points to a high degeneracy of the CEF levels related to the Tb surrounding with almost icosahedral symmetry.

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