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Exploration of the Berry phase interference in a single-molecule magnets of trigonal symmetry H.M. QUDDUSI, Department of Physics, University of Central Florida, J. LIU, Department of Physics, University of Florida, P.L. FENG, Department of Chemistry and Biochemistry, University of California at San Diego, E. DEL BARCO, Department of Physics, University of Central Florida, S. HILL, National High Magnetic Field Laboratory and Department of Physics, Florida State University, D.N. HENDRICKSON, Department of Chemistry and Biochemistry, University of California at San Diego — The quantum behavior of single-molecule magnets (SMM) is mainly governed by their molecular composition and crystallographic symmetries, thus playing an essential role in the tunneling dynamics. We present low temperature magnetometry measurements on a trigonal symmetric, low nuclearity Mn3 SMM. The experiments are designed to explore the behavior of the tunnel splittings within the transverse field magnitude/direction phase space, by applying a transverse field (0-1 T) along different directions within the hard anisotropy plane of the molecules. The expected quantum interference pattern can be understood as an outcome of a competition between different intramolecular magnetic interactions. A multi-spin description using non-collinear zero-field splitting tensors and intra molecular dipolar interactions between the manganese ions is employed to explain the symmetry patterns.

Hajrah Quddusi
Department of Physics, University of Central Florida

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