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Quantum Tunneling of Magnetization in Trigonal Single-Molecule Magnets JUNJIE LIU, Department of Physics, University of Florida, ENRIQUE DEL BARCO, Department of Physics, University of Central Florida, STEPHEN HILL, NHMFL and Department of Physics, Florida State University — We perform a numerical analysis of the quantum tunneling of magnetization (QTM) that occurs in a spin $S = 6$ single-molecule magnet (SMM) with idealized C_3 symmetry. The deconstructive points in the QTM are located by following the Berry-phase interference (BPI) oscillations. We find that the $\hat{O}_4^3$ ($= \frac{1}{2}[\hat{S}_z, \hat{S}_+^3 + \hat{S}_-^3]$) operator unfreezes odd-k QTM resonances and generates three-fold patterns of BPI minima in all resonances, including $k = 0$! This behavior cannot be reproduced with operators that possess even rotational symmetry about the quantization axis. We find also that the $k = 0$ BPI minima shift away from zero longitudinal field. The wider implications of these results will be discussed in terms of the QTM behavior observed in other SMMs.

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