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Uniaxial-pressure dependence of the magnetization dynamics in the high-symmetry single-molecule magnet Mn12-MeOH JAMES H. ATKINSON, Dept. of Physics, University of Central Florida, Orlando, FL, and the Dept. of Physics, Amherst College, Amherst, MA, LAKSHMI BHASKARAN, STEPHEN HILL, National High Magnetic Field Laboratory and Dept. of Physics, Florida State University, Tallahassee, FL, YURI MYASOEDOV, ELI ZELDOV, Dept. of Condensed Matter Physics, Weizmann Institute of Science, Rehovot, Israel, ENRIQUE DEL BARCO, Dept. of Physics, University of Central Florida, Orlando, FL, JONATHAN FRIEDMAN, Dept. of Physics, Amherst College, Amherst, MA, ADELINE FOURNET, GEORGE CHRISTOU, Dept. of Chemistry, University of Florida, Gainesville, FL — The single-molecule magnet [Mn12O12(O2CCH3)16(CH3OH)4]CH3OH ("Mn12-MeOH") is a high-symmetry sibling of the Mn12-Acetate SMM that offers a prime opportunity to explore the consequences of molecular symmetry. A previous study [1] has shown that applied pressure induced changes in the Mn12-Acetate's anisotropy parameters. Here we present the results of a study in which uniaxial pressure was applied to a crystalline sample of Mn12-MeOH in order to examine how the pressure affects the quantum tunneling of magnetization at low temperature. We find that the pressure induces an increase in the resonant tunneling rate manifested as a change in the height of the tunneling steps in the magnetic hysteresis. These results suggest that pressure is altering symmetry-breaking terms in the molecule's spin Hamiltonian, giving rise to increased tunneling.

[1] J. H. Atkinson, K. Park, C. C. Beedle, D. N. Hendrickson, Y. Myasoedov, E. Zeldov and J. R. Friedman, EPL 102, 47008 (2013)

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