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Pressure-dependence of the zero-field splittings for the Fe_8 single-molecule magnet S. TAKAHASHI, E. THOMPSON, S. HILL, Physics, University of Florida, S. W. TOZER, NHMFL, Florida State University, A. G. HARTER, N. S. DALAL, Chemistry and Biochemistry and NHMFL, Florida State Univerisity — We present a study of the pressure-dependent electron paramagnetic resonance (EPR) spectrum for the Fe_8 single-molecule magnet (SMM). The biaxial $[Fe_8O_2(OH)_{12}(tacn)_6]Br_8{\cdot}9H_2O$ (Fe_8) SMM has recently been studied extensively because its low-temperature magnetization dynamics are dominated by quantum tunneling of its spin S = 10 magnetic moment through a sizeable anisotropy barrier. To date, chemical methods have usually been employed in order to control the magnetic quantum tunneling (MQT) behavior of a SMM, e.g. by varying the magnetic ions in the molecular core, or the ligand/solvent environment. The advantage of this approach is that many different SMMs can be realized in this way, with widely varying MQT behavior. However, controllable variation of MQT is difficult. As an alternative approach for manipulation of the MQT, we have recently studied the effect of physical pressure on the Fe_8 SMM. In this presentation, we show the pressure dependence of the zero-field splittings of Fe_8, as studied by an angle and pressure-dependent high-frequency EPR technique.

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