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Pressure tuning of anisotropy barrier in Fe_8 SMMs probed using high frequency EPR KOMALAVALLI THIRUNAVUKKUARASU, CHRISTOPHER BEEDLE, STANLEY TOZER, National High Magnetic Field Laboratory, STEPHEN HILL, National High Magnetic Field Laboratory and Department of Physics, Florida State University — Single-molecule magnets (SMMs) are spin systems with large spin ground state where quantum phenomena such as tunneling of magnetization via a considerable anisotropy barrier manifest. One such SMM that has been extensively studied is $[Fe_8O_2(OH)_{12}(tacn)_6]Br_8.9H_2O$, also known as Fe_8, with a giant spin ground state of S=10. The eight Fe atoms bridged by the ligands form a butterfly structure where six Fe atoms have spins up and two spins down in the simplest model. This structure in fact gives rise to geometrical spin frustration effects within the cluster. By varying the interaction between the spins, manipulation of quantum tunneling in SMMs may be achieved. Typically, the manipulation of spin interactions is realized using chemical methods. As an alternative approach, we employ high pressure to induce changes in the ligand-field environment of the Fe atoms. In this presentation, the pressure-dependent changes in the anisotropy barrier in single crystal Fe_8 SMMs investigated by high frequency electron paramagnetic resonance measurements will be discussed.

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