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Magnetoelastic coupling through the antiferromagnetic - to - ferromagnetic transition in quasi-two-dimensional $[Cu(pyz)_2HF_2]BF_4$ using infrared spectroscopy[1] J.L. MUSFELDT, L.I. VERGARA, T.V. BRINZARI, University of Tennessee, C. LEE, North Carolina State University, L.C. TUNG, National High Magnetic Field Lab, J. KANG, North Carolina State University, Y.J. WANG, National High Magnetic Field Laboratory, J.A. SCHLUETER, Argonne National Lab, J.L. MANSON, Eastern Washington University, M.-H. WHANGBO, North Carolina State University, UNIVERSITY OF TENNESSEE TEAM, NORTH CAROLINA STATE UNIVERSITY TEAM, NATIONAL HIGH MAGNETIC FIELD LAB TEAM, ARGONNE NATIONAL LAB TEAM, EASTERN WASHINGTON UNIVERSITY TEAM — We investigated magneto-elastic coupling through the field-driven transition to the fully polarized magnetic state in quasi-two-dimensional $[Cu(HF_2)(pyz)_2]BF_4$ by magneto-infrared spectroscopy. This transition modifies out-of-plane ring distortion and bending vibrational modes of the pyrazine ligand. The extent of these distortions increases with field, systematically tracking the low temperature magnetization. These distortions weaken the antiferromagnetic spin exchange, a finding that provides important insight into magnetic transitions in other copper halides.

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Janice Musfeldt
University of Tennessee

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