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Contrasting low-dimensional magnetism in the 3D metal-organic frameworks $[Cu(VF_6)(pyz)_2]\bullet 4H_2O$ and $[Cu(HF_2)(pyz)_2]SbF_6$ (pyz = pyrazine)[1] JAMIE MANSON, Department of Chemistry and Biochemistry, Eastern Washington University, Cheney, WA 99004 USA, JOHN SCHLUETER, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439 USA, PAUL GODDARD, Clarendon Laboratory, Department of Physics, University of Oxford, Oxford OX1 3PU UK, JOHN SINGLETON, ROSS MCDONALD, OSCAR AYALA-VALENZUELA, MPA-NHMFL, Los Alamos National Laboratory, Los Alamos, NM 87545, TOM LANCASTER, STEPHEN BLUNDELL, Clarendon Laboratory, Department of Physics, University of Oxford, Oxford OX1 3PU UK — $[Cu(VF_6)(pyz)_2]\bullet 4H_2O$ (**1**) and $[Cu(HF_2)(pyz)_2]SbF_6$ (**2**) form tetragonal frameworks that consist of 2D $[Cu(pyz)_2]^{2+}$ square lattices that are linked in 3D by bridging VF_6^{2-} (**1**) or HF_2^- (**2**) anions. Magnetic susceptibility data shows apparent paramagnetism, although not simple Curie-Weiss behavior, in **1**. For **2**, a broad maximum in $\chi(T)$ at 12.5 K and a sharp kink at 4.3 K indicate short- (SRO) and long-range (LRO) magnetic ordering, respectively. Additional experimental data for **1** (e.g., heat capacity and μ^+SR) however, indicate that a LRO state occurs below 3.6 K whereas pulsed-field magnetization data suggest a superposition of AFM Cu^{2+} layers and fluctuating V^{4+} moments. The structural and magnetic behavior of **1** and **2** will be described as well as possible new directions.

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Jamie Manson
Eastern Washington University

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