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Unusual Magnetic-Pressure Response of an $S = 1$ Antiferromagnetic Linear-Chain near the $D/J \approx 1$ Critical Point^{*1}
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An $S = 1$ chain, $[\text{Ni}(\text{HF}_2)(3\text{-Clpy})_4]\text{BF}_4$ (py = pyridine), has been identified to have nearest-neighbor antiferromagnetic interaction $J/k_B = 4.86$ K and single-ion anisotropy $D/k_B = 4.3$ K, while avoiding long-range order to 25 mK.[†] With $D/J = 0.88$, this system is close to the $D/J \approx 1$ gapless quantum critical point between the Haldane and Large- D phases. The magnetization was studied at $50 \text{ mK} \leq T \leq 1 \text{ K}$ and with $B \leq 10 \text{ T}$.[‡] Using a magnetometer equipped with a pressure cell, the low-field (0.1 T), high temperature ($T \geq 2 \text{ K}$) magnetic susceptibility was studied to 1.47 GPa. These data suggest the response at ambient pressure[†] changes between 0.24 GPa and 0.35 GPa. These studies have been or are being extended by ^1H NMR experiments capable of varying the pressure, inelastic neutron scattering investigations down to 300 mK, and X-ray diffraction at 300 K and with pressures up to nominally 1.5 GPa. The status of the analysis of all of the data sets will be provided.

[†] J.L. Manson *et al.*, Inorg. Chem. 51 (2012) 7520.

[‡] J.-S. Xia *et al.*, arxiv.1409.5971 (2014).

* This work is a collaboration involving M.K. Peprah, P.A. Quintero, J.S. Xia, Y. Tao, X. Zuo, J.M. Pérez, A. Garcia, S.E. Brown, S. Lapidus, and J.L. Manson.

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