

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Magnetic field-induced XY-AFM in 2D Heisenberg Antiferromagnet $[\text{Cu}(\text{pyz})_2(\text{pyO})_2](\text{PF}_6)$ YOSHIMITSU KOHAMA, NHMFL, Los Alamos National Laboratory, Los Alamos, NM 87545, USA, MARCELO JAIME, NHMFL, Los Alamos National Laboratory, Los Alamos NM 87545, USA, JAMIE MANSON, Dept. of Chem. and Biochem., E. Washington Univ., Cheney, WA 99004, USA — Specific heat (C_p) and magnetic susceptibility (χ) measurements were performed on the two-dimensional spin-1/2 Heisenberg antiferromagnet $[\text{Cu}(\text{pyz})_2(\text{pyO})_2](\text{PF}_6)_2$ in DC and pulsed magnetic fields up to $H = 15$ T and 40 T, respectively [1]. We observe no long-range magnetic order down to 500 mK in zero applied magnetic field, suggesting that $[\text{Cu}(\text{pyz})_2(\text{pyO})_2](\text{PF}_6)_2$ is close to an ideal 2D AFM and instead undergoes a Berezinskii-Kosterlitz-Thouless (BKT) transition. However, the application of a finite magnetic field induces a clear anomaly in C_p , although not in χ . This behavior is known to be a remarkable signature of magnetic field induced XY-AFM [2]. In addition, $C_p(H)$ measurements in pulsed fields, performed down to $T = 1.5$ K and up to $H = 40$ T, were used to map out the asymmetric Field-Temperature phase diagram which provides additional support for an ideal realization of field-induced XY-AFM in $[\text{Cu}(\text{pyz})_2(\text{pyO})_2](\text{PF}_6)_2$.

[1] Y. Kohama et al., *Rev. Sci. Instrum.* **81**, 104902 (2010).

[2] A. Cuccoli et al., *Phys. Rev.* **B68**, 060402(R) (2003).

Marcelo Jaime
National High Magnetic Field Laboratory, Los Alamos, NM 87545, USA

Date submitted: 28 Dec 2010

Electronic form version 1.4