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**High Frequency ESR study of the two-dimensional Heisenberg antiferromagnet copper pyrazine perchlorate.** JOHAN VAN TOL, SARITHA NELLUTLA, National High Magnetic Field Lab/Florida State University, CHRIS LANDEE, Clark University, Department of Physics — Copper pyrazine perchlorate, $Cu(Pyrazine)_2(ClO_4)_2$, is thought to be an almost prefect 2D Heisenberg antiferromagnet. We have performed single crystal electron magnetic resonance experiments at 120, 240, and 336 GHz on this system. Both the line-width and resonance shift are field-dependant and indicate that the 3D antiferromagnetic ordering temperature increases from 4.2 K at zero field to about 7 K at 12 Tesla. This can be interpreted by a the field-induced XY-behavior, as has been predicted[1]. A. Cuccoli et al., *Phys. Rev. B* **68**, 060402 (2003).

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