

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Exact Diagonalization Study of the Quantum Antiferromagnet Cs_2CuCl_4 ¹ OOKIE MA, J. B. MARSTON, V. F. MITROVIĆ, M.-A. VACHON, Brown University — We exactly diagonalize a model of the quantum antiferromagnet Cs_2CuCl_4 . The quasi two-dimensional material is one of only two strong candidate systems that may exhibit a spin-liquid phase². To compare with NMR experiments we calculate the total magnetization for clusters of up to 24 sites as a function of temperature and the applied magnetic field. The spin-1/2 degrees of freedom reside on an anisotropic triangular lattice; in addition to the usual nearest-neighbor Heisenberg exchange, interactions of the Dzyaloshinskii-Moriya type must also be included³. We investigate the potential importance of additional higher-order terms⁴.

¹Supported in part by NSF DMR-0213818.

²R. Coldea, D. A. Tennant, A. M. Tsvelik and Z. Tylczynski, Phys. Rev. Lett. **86**, 1335 (2001).

³K. Kodama, S. Miyahara, M. Takigawa, M. Horvatic, C. Berthier, F. Mila, H. Kageyama and Y. Ueda, J. Phys.: Condens. Matter **17** L61 (2005).

⁴T. Yildirim, A. B. Harris, Amnon Aharony and O. Entin-Wohlman, Phys. Rev. B **52**, 10239 (1995).

Brad Marston
Brown University

Date submitted: 30 Nov 2005

Electronic form version 1.4