Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Pressure Tuning of the Shastry-Sutherland Quantum Phase Transition S. HARAVIFARD, Argonne National Laboratory, University of Chicago, A. BANERJEE, T.F. ROSENBAUM, University of Chicago, G. SRAJER, J.C. LANG, Y. FENG, Argonne National Laboratory, B.D. GAULIN, H.A. DABKOWSKA, McMaster University — SrCu2(BO3)2 is a quasi-2D quantum spin system known to possess a collective singlet ground state. It serves as an experimental realization of the Shastry-Sutherland model for interacting S=1/2 dimers. The ratio of the intra and inter-dimer exchange in this compound is close to a quantum critical point, where the ground state transforms from a gapped, non-magnetic state to a gapless long-range ordered antiferromagnetic state as a function of the ratio of the strength of the magnetic interactions. We use synchrotron x-ray diffraction in a diamond anvil cell to investigate the pressure-driven quantum phase transition in high-quality single crystals of SrCu2(BO3). We will present the evolution of both the magnetic and structural properties up to pressures of 5 GPa.

S. Haravifard
Argonne National Laboratory, University of Chicago

Date submitted: 20 Nov 2010 Electronic form version 1.4