Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Critical properties of the phase transition between a Bose glass and a magnetic Bose-Einstein condensate in a spin-1 Heisenberg model STEPHAN HAAS, Department of Physics and Astronomy, University of Southern California, Los Angeles, CA 900089-0484, RONG YU, Department of Physics, Renmin University of China, Beijing 100872, China, TOMMASO ROSCILDE, Laboratoire de Physique, Ecole Normale Superieure de Lyon, 69007 Lyon, France — Motivated by recent experiments on the disordered quantum magnets $Ni(Cl^{1-x}Br^{x})^{2}4SC(NH^{2})^{2}$ (Br-doped DTN), we study the critical properties of the magnetic field induced phase transition between a Bose glass and a magnetic Bose-Einstein condensate in a spin-1 Heisenberg model for this system. We determine the location of the critical field of the transition and the order parameter critical exponent via quantum scaling from quantum Monte Carlo simulations. We find that the extracted value of the order parameter critical exponent is sensitive to both the location of the critical field and the field regime of the scaling. We have also calculated the spin excitations across the transition for this system with a SU(3) slave-boson mean-field method, and discuss the connections of our results to the recent neutron measurements.

Stephan Haas
Department of Physics and Astronomy,
University of Southern California, Los Angeles, CA 900089-0484

Date submitted: 15 Nov 2013 Electronic form version 1.4