Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Field-induced multiple-Q phases in a frustrated quantum magnet YOSHITOMO KAMIYA, CRISTIAN BATISTA, Theoretical Division, T4 and CNLS, Los Alamos National Laboratory — We study a frustrated hard-core boson model inspired by recent experiments on the field-induced quantum phase transition in the S=1 dimer antiferromagnet $Ba_3Mn_2O_8$ for a magnetic field H parallel to the c axis. We calculate the effective interactions in the low-density limit by adding the ladder diagrams and determine the ground state phase diagram near the quantum critical point. The phase diagram is very rich and includes different multiple-**Q** Bose-Einstein condensates (BECs) that combine the six degenerate incommensurate lowest-energy modes $\pm \mathbf{Q}_n$ ($1 \leq n \leq 3$) at the quantum critical point. The multiple-**Q** states include a lattice of magnetic vortices that emerges out of frustration between the boson-boson interactions.

Yoshitomo Kamiya
Theoretical Division, T4 and CNLS, Los Alamos National Laboratory

Date submitted: 20 Nov 2012 Electronic form version 1.4