Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Possibility of Deconfined Criticality in SU(N) Heisenberg Models at Small N[1] KENJI HARADA, Graduate School of Informatics, Kyoto University, Japan, TAKAFUMI SUZUKI, Graduate School of Engineering, University of Hyogo, Japan, TSUYOSHI OKUBO, ISSP, University of Tokyo, Japan, HARUHIKO MATSUO, RIST, Japan, JIE LOU, Department of Physics, Fudan University, China, HIROSHI WATANABE, SYNGE TODO, NAOKI KAWASHIMA, ISSP, University of Tokyo, Japan — To examine the validity of the scenario of the deconfined critical phenomena[1], we carry out quantum Monte Carlo simulation for the SU(N) generalization of the Heisenberg model with four-body and six-body interactions[2]. The quantum phase transition between the SU(N) Néel and valence-bond solid phases is characterized for $N = 2, 3$, and 4 on the square and honeycomb lattices. While finite-size scaling analysis works well up to the maximum lattice size ($L = 256$) and indicates the continuous nature of the phase transition, a clear systematic change towards the first-order transition is observed in the estimates of the critical exponent $y \equiv 1/\nu$ as the system size increases. We discuss the details of finite-size scaling analysis. [1] T. Senthil, A. Vishwanath, L. Balentz, S. Sachdev and M.P.A. Fisher, Science 303 (2004). [2] K. Harada, T. Suzuki, T. Okubo, H. Matsuo, J. Lou, H. Watanabe, S. Todo, and N. Kawashima, arXiv:1307.0501.

[1]The computation in the present work is executed on computers at the Supercomputer Center, ISSP, University of Tokyo, and also on the K computer at the RIKEN AICS (project number: hp120283).

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Date submitted: 14 Nov 2013 Electronic form version 1.4