Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Quantum Critical Magnetization Behaviors of the Kagome- and Triangular-Lattice Antiferromagnets TORU SAKAI, JAEA, SPring-8, HIROKI NAKANO, University of Hyogo — Magnetization process of the S=1/2 isotropic Heisenberg antiferromagnets on the kagome and triangular lattices are studied. Data from numerical-diagonalization method up to 39-spin systems, are reexamined from the viewpoint of the derivative of the magnetization with respect to the magnetic field. We find that the behavior of the derivative around the 1/3 height of the magnetization saturation is quite different from the cases of typical magnetization plateaux for the kagome-lattice antiferromagnet. This new phenomenon is called the "magnetization ramp" [1]. We also compare it with the 1/3 magnetization plateau of the triangular antiferromagnet. The critical exponent analysis indicates a clear difference between the magnetization plateau and ramp [2]. In addition using the numerical diagonalization up to 42-spin systems we suggest that the kagome-lattice antiferromagnet has a gapless singlet-triplet excitation in the thermodynamic limit [3].

[1] H. Nakano and T. Sakai: J. Phys. Soc. Jpn. 79 (2010) 053707.
[2] T. Sakai and H. Nakano: Phys. Rev. B 83 (2011) 100405(R).
[3] H. Nakano and T. Sakai: J. Phys. Soc. Jpn. 80 (2011) 053704.

Toru Sakai
JAEA, SPring-8

Date submitted: 03 Nov 2011 Electronic form version 1.4