Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Nontrivial ferrimagnetism on the low-dimensional quantum spin systems with frustration TOKURO SHIMOKAWA, Kobe University, HIROKI NAKANO, University of Hyogo, TORU SAKAI, Japan Atomic Energy Agency, SPring-8 — In low-dimensional quantum spin systems with frustration, nontrivial magnetisms often occur due to strong quantum fluctuation. Ferrimagnetism in non-frustrated systems is well-known to occur from the mechanism based on the Marshall-Lieb-Mattis theorem. This type of ferrimagnetism is called "Lieb-Mattis (LM) type." Recently, the occurrence of nontrivial ferrimagnetism has been reported in some one-dimensional Heisenberg spin systems with frustration, in which the continuous change of spontaneous magnetization and the incommensurate modulation in local magnetization are observed. This type is called "non-Lieb-Mattis (NLM) type." In this study, we tackle a problem whether the NLM ferrimagnetism occurs or not in higher dimensional systems. We investigate the S=1/2 Heisenberg models on the spatially anisotropic two-dimensional (2D) kagome lattice and on the quasi-one-dimensional (Q1D) kagome strip lattices by the numerical diagonalization and density matrix renormalization group methods. The Q1D models share the same structure in their inner part with the spatially anisotropic 2D kagome lattice; we examine two cases with respect to strip width. We will discuss the relationship between the ground-state properties of the Q1D lattices and those of the 2D lattice.

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Date submitted: 06 Nov 2012 Electronic form version 1.4