

Abstract Submitted
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Exotic behavior of the magnetization process of the $S=1/2$ kagome-lattice antiferromagnet at one-third hight of the saturation TORU SAKAI, JAEA, SPring-8, HIROKI NAKANO, University of Hyogo — The magnetization process of the $S=1/2$ Heisenberg antiferromagnet on the kagome lattice is studied by the exact numerical diagonalization [1]. We successfully obtain a new result of the magnetization process of a 42-site cluster in the entire range. Our analysis clarifies that the critical behavior around one-third of the height of the saturation is different from the typical behavior of the well-known magnetization plateau in two-dimensional systems. We also examine the effect of the $\sqrt{3} \times \sqrt{3}$ -type distortion added to the kagome lattice. We find at one-third of the height of the saturation in the magnetization process that the undistorted kagome point is just the boundary between two phases that show their own properties that are different from each other. Our results suggest a relationship between the anomalous critical behavior at the undistorted point and the fact that the undistorted point is the boundary. A similar critical behavior of the magnetization process was also predicted in some other frustrated systems [2,3].

[1] H. Nakano and T. Sakai: J. Phys. Soc. Jpn. 83 (2014) 104710.

[2] H. Nakano, M. Isoda and T. Sakai: J. Phys. Soc. Jpn. 83 (2014) 053702.

[3] M. Isoda, H. Nakano and T. Sakai: J. Phys. Soc. Jpn. 83 (2014) 084710.

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