

# From the triangular lattice to the kagome lattice: Double peak structures and low energy excitations

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Using finite temperature Lanczos method, we study the spin-1/2 Heisenberg model in a lattice that interpolates between the triangular and the kagome lattices. The antiferromagnetic coupling between kagome lattice sites is  $J$ , and the one between a kagome lattice site and a non-kagome lattice site is  $J'$ . At  $T=0$ , Neel order in the triangular antiferromagnet is destabilized for  $J'/J < 0.2$ [1,2]. In this region, we observed the double peak structures in the specific heat. It was also found that the spin susceptibility has two energy scales. We speculate that this behavior is understood as a formation of the effective triangular Heisenberg model on non-kagome lattice sites.

[1] C. Zeng and V. Elser, Phys. Rev. B. **42**, 8436 (1990)

[2] L. Arrachea, *et al.*, Phys. Rev. B. **69**, 224414 (2004)