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# Thermodynamics of the kagome Heisenberg antiferromagnets

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Kagome-lattice Heisenberg antiferromagnet is a paradigmatic model in the field of frustrated magnetism that allows us to study the interplay of geometrical frustration and quantum as well as thermal fluctuations in two and three dimensions. Distinctive spectrum of this model manifest itself in the thermodynamic properties throughout the peculiar low-temperature behavior of the specific heat.

We use 16 terms of a high-temperature series expansion complemented by the entropy-method interpolation to examine the specific heat and the uniform susceptibility of the Heisenberg model on the three-dimensional kagome (hyperkagome) lattice. We obtain thermodynamic quantities for several scenarios determined by the behavior of the specific heat as the temperature tends to zero. All scenarios give rise to a low-temperature peak in $c(T)$ well below the main high-temperature peak. The functional form of the uniform susceptibility $\chi(T)$ below about $T = 0.5$ depends strongly on the chosen scenario. An estimate for the ground-state energy $e_0$ depends on the adopted specific scenario but is expected to lie between $-0.441$ and $-0.435$. In addition to the entropy-method interpolation, we use the finite-temperature Lanczos method to calculate $c(T)$ and $\chi(T)$ for finite lattices of $N = 24$ and 36 sites.

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