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【189】 Finite temperature investigation of the ferroJ1-J2 model

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We study the spin-1/2 Heisenberg model on the square lattice with ferromagnetic nearest-neighbor coupling $J_1 < 0$ and frustrated antiferromagnetic next-nearest coupling coupling $J_2 > 0$. For spin-1/2, the zero-temperature phase diagram differs from the $J_1 < 0$ case, with a first order transition to the ferromagnetic state.

By combining tensor network methods and spin wave theory, we draw the finite temperature phase diagram of the model. We locate the critical point ending the first order line in addition to the Ising transition at large J_2. Our results support the absence of a spin nematic phase in the intermediate region at zero field.

Theoretical Work

Theory

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