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[137] Tensor network investigation of the finite temperature behaviour of the $J_1 - J_2 - J_3$ Kagome Ising Antiferromagnet

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The finite temperature behavior of the Kagome Ising Antiferromagnet with farther neighbor interactions (J_1, J_2, J_3) is investigated with the Corner Transfer Matrix Renormalization Group (CTMRG) algorithm. In the parameter region $J_1 > J_3 > J_2 > 0$, the system breaks a \mathbb{Z}_3 rotation symmetry and a \mathbb{Z}_2 translation symmetry in the ground state. These symmetries are restored at higher temperature either in a single first-order transition or through a couple of transitions separated by an intermediate nematic phase, depending on the value of J_2 .

In the limit $J_1, J_3 \gg J_2$, the rotational symmetry is restored in a sequence of first-order transitions whose discrete character can be understood from the quantisation of the density of extended defects (Domain Walls).

Theoretical Work

Theory

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