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(POS-11) Spin Ice Spectrum with Finite Temperature in Pyrochlores

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spin ice material has many interesting properties such as geometrical frustration, non-zero magnetic moment and magnetic monopoles, the spin ice especially the quantum spin ice material was an active research areas. When temperature is low enough, the quantum fluctuation in spin ice material can lead to a liquid like material known as quantum spin liquid. In this paper, we use group theory to block diagonalize the Hamiltonian of 16 site Pyrochlore system and find the spin ice states. We start with the pure spin ice Hamiltonian and slowly turn the Hamiltonian to quantum spin ice by adding exchange constants as perturbation. Finally, we plot the spin ice spectrum with different exchange constants in finite temperature.

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