Title:	Cluster Mean Field Theory(CMFT) study of frustrated spin systems
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Keywords:	Majumdar-Ghosh Model Spin chain Lowest energy solution
Issue Date:	May-2024
Publisher:	IISER Mohali
Abstract:	This project used cluster mean-field (CMFT) to investigate the quantum phase di- agram of different nearest-neighbor and next-nearest neighbor J1-J2 Heisenberg spin lattices and the Shastry-Sutherland Lattice. Different coupling ranges of SSL lattices were explored, including anisotropic dimer interaction, ferromagnetic inter-dimer interactions, and spatially anisotropic frustrations. The main goal of the thesis was to present a comprehensive study and explanation of the presence of fractional mag- netic plateaux phases in the ground state phase diagram of the Shastry-Sutherland lattice under an applied magnetic field at different temperatures in the thermody- namic limit.
Description:	Under Embargo Period
URI:	http://hdl.handle.net/123456789/5646
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