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Thesis Title	<i>Quantum Ising chain in inhomogeneous transverse magnetic field</i>
Supervisor	F. Diakonos, Associate Professor
Summary	<p>Quantum phase transitions occur at zero temperature by tuning a non-thermal parameter of the system. This behavior is due to quantum fluctuations, which drive the system in change of its ground state, destroying the long range order at absolute zero.</p> <p>At the present thesis we study the one dimensional Ising model in transverse magnetic field which has a quantum phase transition. The quantum critical point is specified in two ways: (i) By the diagonalization of the Hamiltonian (ii) Mapping to a classical system, which is also done for the case where the magnetic field and interactions among spins are, generally, different. Next we present the results of simulations, via the Metropolis algorithm, for the two dimensional Ising classical model. Specifically, we simulate the model in the case of equal interactions in both directions and in the case of different interactions we compare our results with the Kramers-Wannier relation. This study is based on the principles and techniques of remote sensing as these are applied with the use of satellite images from LANDSAT 8 and MODIS.</p>
Key words	Quantum phase transitions, Ising model, Metropolis algorithm
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