Title:	Monte Carlo Simulations of BFSS and IKKT Matrix Models
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Abstract:	In this thesis, we studied the bosonic BFSS and IKKT matrix models using Monte Carlo simulations. First, we explored some toy models to check the validity of the numerical simulations. Then we simulated the BFSS matrix model using Hamiltonian Monte Carlo (HMC) algorithm. In the BFSS matrix model, we used the Polyakov loop as an order parameter to investigate the large-N behaviour of this model at different temperatures. Our simulations confirmed that the model exhibits a confinement-deconfinement phase transition as the temperature of the system is varied. Besides the Polyakov loop, other observables such as internal energy and extent of space were also computed. In the bosonic IKKT model, we studied the spontaneous symmetry breaking (SSB) of SO(10) symmetry using the moment of inertia tensor and found that there is no SSB of SO(10) symmetry in this model. Besides the eigenvalues of the moment of inertia tensor, other observable such as extent of spacetime was also computed. We also studied the simulation theory of the phase quenched IKKT model.
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