

The analysis of the Lorentzian IKKT matrix model at large D

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The IKKT matrix model is the most promising candidate of a non-perturbative formulation of superstring theory. Recently it has been proposed to introduce the Lorentz invariant mass term as a regularization. This model has $SO(9,1)$ Lorentz symmetry, and a partition function diverges due to the non-compactness of the volume of the Lorentz group. In this study, we have done the analytical calculation at large D. In the case with $N=2$, there are three classical solutions in total. We clarified the physical meaning of the solutions and a phase diagram of the theory by doing a $1/D$ expansion around each solution.

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