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ZN stability and continuity in the twisted Eguchi-Kawai model with adjoint fermions

In the large-N limit, lattice gauge theory is suggested to be equivalent to a zero-dimensional matrix model with twisted boundary conditions, known as the Twisted Eguchi-Kawai model. However, maintaining the ZN symmetry that ensures equivalence with the gauge theory typically requires a careful tuning of the twist parameters as large-N. In this talk, we propose a model in which the ZN vacuum is stabilized by the introduction of heavy adjoint fermions, without the need for parameter tuning. We present our results on the vacuum structure and physical quantities in this framework. Furthermore, by extending the model, we construct a one-dimensional matrix model corresponding to SU(N) gauge theory on compact spacetime, and demonstrate the continuity of the QCD confining phase at the level of matrix models.

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