Monte Carlo studies of the six-dimensional IKKT model

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$$S = -\frac{N}{4}\mathrm{tr}\,[A_\mu, A_\nu]^2 + \frac{N}{2}\mathrm{tr}\,\bar{\psi}_\alpha(\Gamma_\mu)_{\alpha\beta}[A_\mu, \psi_\beta].$$

- Spontaneous rotational symmetry breakdown

  $\Rightarrow$ **complex phase of the fermion determinant**.

- Monte Carlo simulation of the matrix model

  $\Rightarrow$ factorization method K.N. Anagnostopoulos, J. Nishimura, hep-th/0108041.