Spontaneous breakdown of Lorentz symmetry in a simplified IKKT matrix model

Takehiro Azuma

High-energy accelerator research organization (KEK)
$\Rightarrow$ Tata Institute of Fundamental Research (TIFR)

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with Konstantinos N. Anagnostopoulos and Jun Nishimura

Simplified matrix model in 4d with spontaneous rotational symmetry breakdown, J. Nishimura, hep-th/0108070.

$$S = \underbrace{\frac{N}{2}\mathrm{tr}\, A_\mu^2}_{=S_b} \underbrace{-\bar{\psi}_\alpha^f (\Gamma_\mu)_{\alpha\beta} A_\mu \psi_\beta^f}_{=S_f}$$

- 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.