Contribution ID: 104

Type: not specified

Lattice determination of the topological susceptibility slope χ' of $2d~{\rm CP}^{N-1}$ models at large N

Monday, 19 December 2022 17:35 (20 minutes)

We compute the topological susceptibility slope χ' , related to the second moment of the two-point correlator of the topological charge density, of $2d \operatorname{CP}^{N-1}$ models for N = 5, 11, 21 and 31 from lattice Monte Carlo simulations. Our strategy consists in performing a double limit: first, we take the continuum limit of χ' at fixed smoothing radius in physical units; then, we take the zero-smoothing-radius limit. Since the same strategy can also be applied to 4d gauge theories and full QCD, where χ' plays an intriguing theoretical and phenomenological role, this work constitutes a step towards the lattice investigation of this quantity in such models.

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