

Lee-Yang on the Fuzzy Sphere - Results and Summary

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In the first part, we review the Lee-Yang theorem and the associated Lee-Yang conformal field theory (CFT). We then introduce a Fuzzy Sphere regulator to study the 3D Lee-Yang CFT. The model is constructed by deforming the Ising model on the Fuzzy Sphere with a purely imaginary longitudinal magnetic field, leading to a quantum phase transition.

In the second part, we present the main results of arXiv:2505.07655, where the critical point of the model is identified with the 3D Lee-Yang CFT. We describe how to tune the model and show that the lowest-lying states of the Hamiltonian align well with the expected CFT spectrum. We discuss Fuzzy Sphere estimates for the scaling dimension $\Delta\phi$ of the lowest primary operator and interpret small deviations from the expected CFT values in terms of leading irrelevant operators. Finally, we show that the Fuzzy Sphere results are consistent with the best available five-loop ϵ -expansion estimates.

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