

Perturbative dynamics of fuzzy spheres at large N

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3d bosonic Yang-Mills-Chern-Simons(YMCS) model:

$$S = N \text{tr} \left(-\frac{1}{4} [A_\mu, A_\nu]^2 + \frac{2i\alpha}{3} \epsilon_{\mu\nu\rho} A_\mu A_\nu A_\rho \right).$$

Toy model incorporating fuzzy sphere classical solution:

$$A_\mu = \alpha L_\mu, \text{ where } L_\mu = (N \times N \text{ rep. of } \text{SU}(2)).$$

We scrutinize the dynamics of the fuzzy sphere for the multi-loop perturbation.

- “One-loop dominance” holds for the *effective action* Γ .
- “One-loop dominance” does not hold for the *generic observables*.