

In this article the authors develop a new renormalization group (RG) approach to matrix models. The new approach is made possible by applying the large- N RG method of Brézin and Zinn-Justin [1] to a ϕ^4 scalar field theory on fuzzy sphere, or a matrix realization of non-commutative two-sphere [2]. In the ordinary large- N RG method the matrix reduction prescription (from $N \times N$ matrices to $(N - 1) \times (N - 1)$ ones) is artificial and arbitrary but use of fuzzy sphere in the large- N RG method allows suitable treatments for such reduction in terms of the representation of $SU(2)$ or the matrix size N . Taking advantage of such treatments, the authors carry out fixed point analysis of the ϕ^4 theory on fuzzy sphere and calculate (nontrivial) fixed points of the coupling constants in the large N limit. The results are consistent with numerical studies (see, for example, [3]). This article is a digest version of the original paper [4] where the reader can find full details of the material.

References

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