Instanton Corrections in Infinite Distance Limits

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Abstract

In perturbative string theory, the couplings in the effective action arise from integrating out light states (Kaluza-Klein momenta, winding and string oscillators modes) together with non-perturbative corrections, which are invisible to the loop expansion. We aim to generalize this picture, in the spirit of the Emergence Proposal, to arbitrary infinite distance limits by identifying which contributions the light towers of states generate. In this talk, we take the R^4-term as a laboratory across general infinite distance limits, and we argue that the one-loop Schwinger integral over the light towers reproduces all instanton corrections with action bounded by the ratio of the species scale over the mass scale of the lightest tower. This proposal is supported by considering the entire eight-dimensional moduli space of maximally supersymmetric theories and several examples in seven dimensions.

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