The Emergence Proposal: Vector-Multiplet Kinetics at one-loop

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Abstract

The Emergence Proposal suggests that kinetic terms in effective theories of quantum gravity are generated by integrating out towers of massive states, providing a possible microscopic origin for several Swampland constraints. We study this mechanism in Type II string theory compactified on Calabi–Yau manifolds. In particular, at large complex structure, we show that the classical cubic contribution to the vector-multiplet prepotential can be recovered from the ultraviolet contribution of a heavy tower of states. The same framework naturally points to a class of non-perturbative corrections to the topological string free energy that were absent in the original calculations.

Keywords: Swampland, Effective Field Theories, Type II String, Heterotic String

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