

Emergence of F^4 -couplings in Heterotic/Type IIA theories

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The M-theoretic emergence proposal claims that in an isotropic decompactification limit to M-theory the full effective action is generated via quantum effects by integrating out only the light towers of states of the theory. In the BPS particle sector, these include transversally wrapped M2- and M5-branes possibly carrying Kaluza-Klein momentum. A longitudinally wrapped M5-brane, i.e. a wrapped D4-brane, is thus not included in emergence computations. In this talk, we collect explicit evidence supporting this point via an F^4 gauge coupling in six dimensions, using the duality between heterotic string theory on T^4 and strongly coupled type IIA on $K3$. The goal is not only to test the M-theoretic refinement of the Emergence Proposal but also to interpret it as a tool to make predictions for the microscopic behavior of string amplitudes.

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