

Heterotic MSSM on a Resolved Orbifold

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We construct an MSSM with three generations from the heterotic string compactified on a smooth 6D internal manifold using Abelian gauge fluxes only. The compactification space is obtained as a resolution of the $T^6/Z_2 \times Z_2 \times Z_2$, free orbifold. The Z_2 , free involution of such a resolution breaks the $SU(5)$ GUT group down to the SM using a suitably chosen Wilson line. Surprisingly the spectrum on a given resolution is larger than that on the corresponding orbifold taking into account the branching and Higgsing due to the blow-up modes. The existence of extra resolution states is closely related to the fact that the resolution procedure is not unique, rather the various resolutions are connected to each other by flop transitions.

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