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Non-supersymmetric heterotic model building

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We investigate orbifold and smooth Calabi-Yau compactifications of the non- supersymmetric heterotic SO(16)×SO(16) string. We focus on such Calabi-Yau backgrounds in order to recycle commonly employed techniques, like index theorems and cohomology theory, to determine both the fermionic and bosonic 4D spectra. We argue that the N=0 theory never leads to tachyons on smooth Calabi-Yaus in the large volume approximation. As twisted tachyons may arise on certain singular orbifolds, we conjecture that such tachyonic states are lifted in the full blow-up. We perform model searches on selected orbifold geometries. In particular, we construct an explicit example of a Standard Model-like theory with three generations and a single Higgs field.

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