

## Observing the coupling constant of stringy $Z'$

### Abstract

In this work we analyze the resulting RGE running of couplings of additional  $U(1)$  appearing in MSSM-like models coming from orbifold compactifications of heterotic strings. We calculate the coefficients of the beta function to obtain the values of the coupling constant of the additional  $Z'$  in the unification scale  $M_{GUT}$  and  $Z'$  breaking scale, both as a functions of  $M_{GUT}$ . We indicate the first most frequent of these results and the total range of values. At low energies, we find in realistic models that the structure constant of  $Z'$  forces can have values from 18.732 to 95.853, which might influence future searches of  $Z'$  at colliders. We also identify models that present unification and describe the spectrum of some models.

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