

The little hierarchy problem in the light of extra dimensions

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In this work it was studied within the NMSSM, a requirement upon the soft terms at the GUT scale that alleviates the little hierarchy problem. In particular, for vanishing soft terms at the GUT scale except for the Higgs sector and gaugino masses, a special relation between soft gaugino and Higgs masses was computed that leads to a low electroweak scale. The latter GUT configuration arises from higher dimensional theories with gauge and Higgs fields in the bulk and the supersymmetry breaking field at a spatially separated brane. Furthermore, an explicit example motivated by higher dimensional orbifold GUTs in heterotic string theory was shown to provide the required relation. Soft terms were derived in a model independent way for supersymmetric non renormalizable theories of cutoff Λ and applied to the example.

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