

Planck 2013 From the Planck Scale to the Electroweak Scale

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The Higgs mass from stringy high scale SUSY

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The Higgs quartic coupling has now been indirectly measured at the electroweak scale. Assuming no new low-scale physics, its running is known and, together with gauge and Yukawa couplings, it is a crucial new piece of information constraining UV completions of the Standard Model. In particular, supersymmetry broken at an intermediate or high energy scale with low $\tan(\beta)$ is consistent with present data and has an independent theoretical appeal. We analyze the possible string-theoretic motivations for $\tan(\beta) \sim 1$ in Higgs sectors realized on either 6- or 7-branes. We identify specific geometries where a vanishing quartic coupling may arise naturally and specify the geometrical problems which need to be solved to determine its precise value in the generic case. Finally we consider models with negative quartic couplings at the SUSY breaking scale.

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