

Finite Unification

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Abstract content

All-loop Finite Unified Theories (FUTs) are $N=1$ supersymmetric Grand Unified Theories (GUTs) which have a remarkable predictive power due to the required reduction of couplings. Finiteness results from the fact that there exist RGI relations among dimensionless couplings that guarantee the vanishing of all beta-functions in certain $N=1$ GUTs even to all orders. Furthermore developments in the soft supersymmetry breaking sector of $N=1$ GUTs and FUTs lead to exact RGI relations, i.e. reduction of couplings, in this dimensionful sector of the theory too. Based on the above theoretical framework phenomenologically consistent FUTs have been constructed. Here we present FUT models based on the $SU(5)$ and $SU(3)^3$ gauge groups and their predictions. Of particular interest is the Higgs mass prediction of one of the models which is expected to be tested at the LHC.

Summary

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