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Exact SU(5) Yukawa matrix unification in the General Flavour Violating MSSM

Content :

The simplest Grand Unified Theory (GUT) embedding the Standard Model (SM) is based on the SU(5) symmetry. The unification of gauge couplings, failing in the SM, takes place in the R-parity conserving Minimal Supersymmetric Standard Model (MSSM).

We investigated the possibility of satisfying the minimal SU(5) boundary conditions also for Yukawa matrices at the GUT scale within the MSSM. We found a new region in the model's parameter space consistent with this requirement.

In this talk, we consider non-vanishing flavour off-diagonal entries in the soft SUSY-breaking mass matrices. The diagonal A-terms are assumed to be proportional to the respective Yukawa couplings. We show that a precise bottom-tau and strange-muon Yukawa coupling unification is possible, while the phenomenological constraints are satisfied. These include the flavour and electroweak observables, Higgs physics and the LHC bounds as well as the dark matter relic density and the stability of vacuum.

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