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Predictions of Finite Unified Theories

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We study Finite Unified Theories (FUTs) in the context of low-energy phenomenology observables. The realistic FUTs we have studied all need or imply discrete symmetries to be all-loop finite. We present a detailed scanning of all-loop finite SU(5) FUTs, where we include the theoretical uncertainties at the unification scale and then apply several phenomenological constraints. Taking into account the restrictions from the top and bottom quark masses we can discriminate between different models. Including further low-energy constraints such as B physics observables, the bound on the lightest Higgs boson mass and the cold dark matter density, we determine the predictions of the allowed parameter space for the Higgs boson sector and the supersymmetric particle spectrum of the selected model. We present a similar analysis for SU(3)^3 FUT models, where the theories are finite if and only if they have three generations.

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