

Afflictions of the "minimal" SO(10) GUT

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We present the latest progress in analyzing the minimal potentially realistic non-supersymmetric SO(10) GUT model, whose scalar sector consists of representations $45 + 126 + 10$. Although the model is expected to give a robust proton decay prediction, any analysis is hampered by tachyonic instabilities present in the tree-level scalar potential. The one-loop corrected effective potential indicates that in the perturbative regime the only phenomenologically viable breaking pattern to the Standard Model is through an intermediate $SU(4) \times SU(2) \times U(1)$ symmetry. Most recent developments, however, show that this region of parameter space does not admit a suitable fine-tuning associated to the EW-scale Higgs doublet, implying that the model is perturbatively not viable.

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