

The Higgs Mass, the Top Mass and the Scale of New Physics

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In view of the measured Higgs mass of 125 GeV, the perturbative renormalization group evolution of the Standard Model suggests that our Higgs vacuum might not be stable. I will present recent work where we connected the usual perturbative approach and the functional renormalization group which allows for a straightforward inclusion of higher-dimensional operators in the presence of an ultraviolet cutoff. In the latter framework vacuum stability can be studied in the presence of higher-dimensional operators. Their presence can have a sizable influence on the maximum ultraviolet scale of the Standard Model and the existence of instabilities. Further, I explain how such operators can be generated in specific models. Finally, I discuss the role of the top Yukawa coupling within this scenario.

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