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Higgs boson and Top quark masses as tests of Electroweak Vacuum Stability

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The measurements of the Higgs boson and top quark masses can be used to extrapolate the Standard Model Higgs potential at energies up to the Planck scale. Adopting a NNLO renormalization procedure, we: i) find that electroweak vacuum stability is at present allowed, discuss the associated theoretical and experimental errors and the prospects for its future tests; ii) determine the boundary conditions allowing for the existence of a shallow false minimum slightly below the Planck scale, which is a stable configuration that might have been relevant for primordial inflation; iii) derive a conservative upper bound on type I seesaw right-handed neutrino masses, following from the requirement of electroweak vacuum stability.

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