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TITULO: Benchmarks from vacuum stability in high energy physics

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ABSTRACT:

The scalar particle found at LHC interpreted as the standard model Higgs boson leads to a metastable potential for high energy scales. Precision test for Higgs and top quark masses are indeed golden pieces to unravel

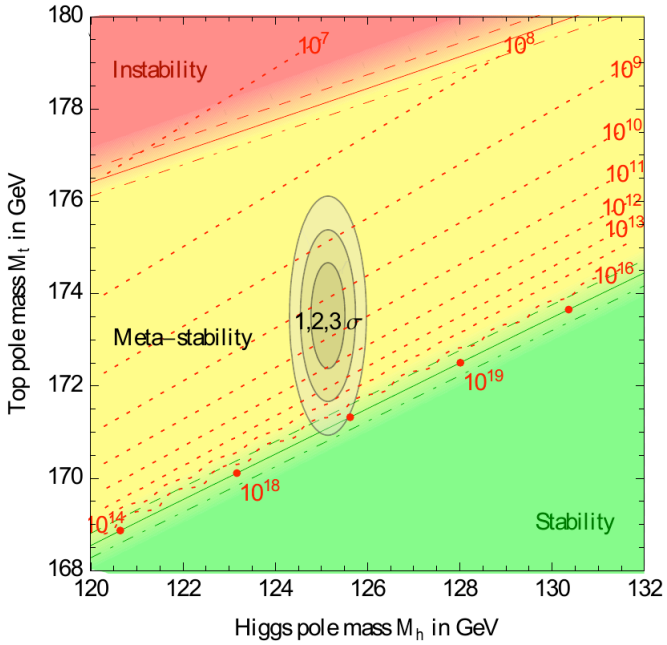

Figure 1: SM phase diagram in terms of Higgs and top pole masses, indicating the region of the preferred experimental range of Mh and Mt [Degrassi et al, 2012 and 2013].

accurate mechanisms behind of this phenomenon. Nevertheless, evocating new physics as threshold completions included even from electroweak scale, would make criticality for standard model can be effectively avoided. In this talk, a review over evolution of foundations about vacuum behavior as well as possible threshold mechanisms to stabilize the Higgs potential in high energy scales will be considered. Finally, since these studies we will discuss prospects and phenomenological consequences for well motivated scenarios based mainly on particular cases of two Higgs doublet models.