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EW vacuum stability depends upon Planck scale physics

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According to the usual analysis, the presence of new physics at very high energy scales (Planck scale) has no impact on the stability condition of the EW vacuum, and the latter depends only on the values of the Higgs and top masses (M_H and M_t). However, it has been recently demonstrated that new physics interactions, even if they show up only at very high energies, can strongly affect the vacuum stability condition. As a consequence, the stability diagram of the Standard Model can be very different from the well known diagram (obtained ignoring new physics at the Planck scale) usually presented. This result has far reaching theoretical and phenomenological consequences. In particular, contrary to what is usually stated, higher precision measurements of M_t (and M_H) will not be able to tell us whether our universe lives in a stable or metastable vacuum state (or at the edge of stability).

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