

On the gauge dependence of the Standard Model vacuum instability scale

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After reviewing the calculation of the Standard Model one-loop effective potential in a class of linear gauges, we discuss the physical observables entering the vacuum stability analysis. In particular, the field value at which the effective potential turns negative (the so-called instability scale, often associated with the physical threshold of the “new physics”) is a gauge dependent quantity. Such a gauge ambiguity is explicitly shown in the case of the Standard Model.

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