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Constraining BSM Scalar Sectors through Vacuum Stability

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Since the LHC has not provided us with any hints towards new physics, it is ever more interesting to constrain BSM theories from purely theoretical considerations. Requiring that the electroweak vacuum in any BSM model is at least metastable, can lead to stringent constraints on the parameter space of the model. Many popular extensions of the SM, such as supersymmetry, feature greatly extended scalar sectors. In the resulting high dimensional scalar potential, vacuum decay can happen in many different field directions. Constraints from vacuum decay thus rely on finding all minima of multidimensional scalar potentials which is a nontrivial task even at tree-level. We present results on the vacuum stability in supersymmetric models from a new code aiming to provide an efficient and reliable check of vacuum stability for use in BSM parameter scans.

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Session Classification: Parallel Session on EW Vacuum Stability