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Little hierarchy in the minimally specified MSSM

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We study constrained versions of the minimal supersymmetric model and investigate the hierarchy between the electroweak scale and the scale of superpartners that can be achieved without relying on specifying model parameters by more than one digit. This approach automatically avoids scenarios in which a large hierarchy is obtained by special choices of parameters and yet keeps scenarios that would be otherwise disfavored by various sensitivity measures. We consider models with universal gaugino and scalar masses, models with non-universal Higgs masses or non-universal gaugino masses and focus on scenarios in which all the model parameters are either of the same order or zero at the grand unification scale. We find that the maximal hierarchy between the electroweak scale and stop masses, requiring that model parameters are not specified beyond one digit, ranges from a factor of 30 for the CMSSM up to 300 for models with non-universal Higgs or gaugino masses.

Primary author: Prof. DERMISEK, Radovan (Indiana University)

Presenter: Prof. DERMISEK, Radovan (Indiana University)

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