



SPEAKER: José Francisco Zurita (University of Zurich)
TITLE: **Beyond MSSM Higgs Bosons at the LHC**
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ABSTRACT

We consider the Higgs sector in extensions of the Minimal Supersymmetric Standard Model by higher-dimension operators in the context of Higgs searches at the LHC 7 TeV run. Such an effective field theory (EFT) approach, also referred to as BMSSM, allows for a model-independent description that may correspond to the combined effects of additional supersymmetric sectors, such as heavy singlets, triplets or gauge bosons, in which the supersymmetry breaking mass splittings can be treated as a perturbation. We consider the current LHC dataset, to set exclusion limits on a large class of BMSSM models. We also present projections for integrated luminosities of 5 and 15 fb⁻¹, assuming that the ATLAS and CMS collaborations will combine their results in each channel. Our study shows that the majority of the parameter space will be probed at the 2 σ level with 15 fb⁻¹ of data. A non-observation of a Higgs boson with about 10 fb⁻¹ of data will point towards a Higgs SUSY spectrum with intermediate $\tan \beta$ (\approx a few to 10) and a light SM-like Higgs with somewhat enhanced couplings to bottom and tau pairs. We define a number of BMSSM benchmark scenarios and analyze the possible exclusion/discovery channels and the projected required luminosity to probe them. We also discuss the results of the EFT framework for two specific models, one with a singlet superfield and one with SU(2)_L triplets.