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Extracting SUSY parameters from LHC measurements using Fittino

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With the advent of the LHC, low-energy Supersymmetry can be probed over the largest part of the theoretically motivated parameter space. Based on detailed experimental studies by the ATLAS and CMS collaborations, we investigate to what extent the parameters of the MSSM as well as of constrained models such as mSugra and GMSB can be measured as a function of the integrated luminosity ranging from 1 fbˆ-1 to 300 fbˆ-1.

Special emphasis is given to a careful evaluation of the stability of a global
chiˆ2 parameter estimation technique encoded in the Fittino package. This technique is based the simulated annealing algorithm for global function minimization with error determination from repeated Monte Carlo experiments ("toy fits"). The method is augmented by an efficient scan of the chiˆ2 hyper-surface in the multi-dimensional parameter space using a Markov-chain Monte Carlo approach.

Furthermore, we investigate the impact of additional constraints on the parameter space from low-energy measurements such as b -> s gamma
and (g-2)_\mu and cosmological constraints on the dark matter density in the Universe. Their impact is evaluated using the MasterCode and MircoMegas packages. Finally, the improvement possible with a future linear collider is also investigated.

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