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A multi-step Fitting Approach to the allowed Parameter Space of the Constrained Minimal Supersymmetric Model and Comparison with the newest LHC Results

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We study the strong correlations between the parameters of the popular Constrained Minimal Supersymmetric Model (CMSSM) with four independent parameters. Knowing these correlations allows to develop a multi-step fitting procedure, which efficiently determines the allowed parameter space by simply minimizing the chi^2 in multiple steps, i.e. first the parameters with the highest correlation are determined. The data included in the fit are the relic density, the b-physics observables, the anomalous magnetic moment of the muon, upper limits on direct neutralino-nucleon scattering cross sections and lower limits on Higgs and sparticle masses from LEP and newest LHC data.
With this new fitting method and including non-Gaussian systematic errors we find a significantly larger allowed parameter region than previous methods based on random or Markov Chain sampling of the parameter space.

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