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Multilepton signals of gauge mediated supersymmetry breaking at the LHC

Monday 2 December 2013 16:25 (25 minutes)

Working in the framework of General Gauge Mediation (GGM) we briefly discuss how the GGM parameter space is constrained by requiring the Higgs mass to be at 125 GeV. In particular we explain to what extent the GGM parameter space is still a good collider signature generator for LHC.

We then focus on models where the low mass region of the superpartner spectrum consists of the three generations of charged
sleptons and the nearly massless gravitino. Motivated by the fact that both the hierarchies among the stau and the other sleptons can be realized in gauge mediation models, we present spectra with either stau NLSP or selectron/smuon co-NLSP.

We discuss if and how such models can provide an explanation for the anomalous four lepton events recently observed by the CMS collaboration, while satisfying other existing experimental constraints. Generically, these models also give rise to final states with more than four leptons, offering alternative channels in which they can be probed and we estimate the corresponding production rates at the LHC.

Finally, we comment on how the presence of a light stau at the edge of the LEP limit in our best fit benchmark motivates further investigation about the possible impact of LHC searches on the stau mass bound.

- Reference:: arXiv:1310.0018, arXiv:1303.0870

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