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Collider signatures of goldstini in gauge mediation

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Abstract:

We investigate the collider signatures of the multiple goldstini scenario in the framework of gauge mediation. This class of models is characterized by a visible sector (e.g. the MSSM or any extension) coupled by gauge interactions to more than one SUSY breaking sector. The spectrum consists of a light gravitino LSP, behaving as a goldstino, and a number of neutral fermions (the pseudo-goldstini) with a mass between that of the LSP and that of the lightest particle of the observable sector (LOSP). We consider a situation where the LOSP is the lightest neutralino and there is only one pseudo-goldstino of a mass of $O(100)$ GeV. The coupling of the LOSP to the pseudo-goldstino can be enhanced with respect to those of the gravitino giving rise to characteristic signatures. We show that the decay modes of the LOSP into a photon or Z-boson and a pseudo-goldstino can be significant. We then proceed to analyze (pseudo)-goldstini production at future e^+e^- linear colliders and at the LHC. Compared to standard gauge mediation the photon spectrum is softer and more structured.

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