

## High Energy Physics - Phenomenology

# Gaugino Anomaly Mediated SUSY Breaking: phenomenology and prospects for the LHC

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We examine the supersymmetry phenomenology of a novel scenario of supersymmetry (SUSY) breaking which we call Gaugino Anomaly Mediation, or inoAMSB. This is suggested by recent work on the phenomenology of flux compactified type IIB string theory. The essential features of this scenario are that the gaugino masses are of the anomaly-mediated SUSY breaking (AMSB) form, while scalar and trilinear soft SUSY breaking terms are highly suppressed.

Renormalization group effects yield an allowable sparticle mass spectrum, while at the same time avoiding charged LSPs; the latter are common in models with negligible soft scalar masses, such as no-scale or gaugino mediation models. Since scalar and trilinear soft terms are highly suppressed, the SUSY induced flavor and CP-violating processes are also suppressed. The lightest SUSY particle is the neutral wino, while the heaviest is the gluino. In this model, there should be a strong multi-jet + $\bar{t}$ miss signal from squark pair production at the LHC. We find a  $100 \text{ fb}^{-1}$  reach of LHC out to  $m_{\{3/2\}} \sim 118 \text{ TeV}$ , corresponding to a gluino mass of  $\sim 2.6 \text{ TeV}$ . A double mass edge from the opposite-sign/same flavor dilepton invariant mass distribution should be visible at LHC; this, along with the presence of short-- but visible-- highly ionizing tracks from quasi-stable charginos, should provide a smoking gun signature for inoAMSB.

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