

Unraveling the Particle World and the Cosmos at Berkeley—Workshop in Honor of Lawrence Hall and Hitoshi Murayama



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Anomaly Mediated SUSY breaking in $Sp(N)$ Gauge Theories

We present a careful study of the chiral symmetry breaking minima and other potential minima in supersymmetric symplectic QCD ($Sp(N)$ with F flavors) perturbed by Anomaly Mediated Supersymmetry Breaking (AMSB). This is an application of “UV insensitive” AMSB as a tool for approximating non-SUSY gauge theories — an idea initiated by Professor Hitoshi Murayama. Although the case of $F = N+1$ requires particular care due to the inherently strongly coupled nature of the quantum modified moduli space, we are able to show that all $Sp(N)$ theories to which AMSB can be applied ($F < 3(N+1)$) possess stable chiral symmetry breaking minima, which are plausibly continuously connected to the vacua of QCD-like $Sp(N)$ theories for large SUSY breaking, and are protected from runaways to incalculable minima. Unlike $SU(N)$ theories, here the runaway induced by 2-loop AMSB in the dual squark direction is naturally lifted by the tree level SUSY potential at the upper end of the free magnetic phase [$1.43(N+1)$ lesssim $F \leq 1.5(N+1)$] and the lower edge of the conformal window.

Title

Abstract

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