



Higgs boson mass in GMSB with messenger-matter mixing

Friday 6 July 2012 09:30 (15 minutes)

In minimal models of gauge mediated SUSY breaking the mass of the lightest neutral Higgs boson cannot exceed about 118 GeV, provided that the SUSY particle masses are below 2 TeV. This work investigates the Higgs boson mass in the presence of messenger–matter mixing. Such mixing would generate a non-zero A -term (trilinear soft SUSY breaking term) at the messenger scale, which enhances the Higgs mass to about 126 GeV, even when all superparticle masses are below a TeV. Such a spectrum is shown to be consistent with recent LHC limits. The increase in m_h is maximal in the case of messengers belonging to $10+10^*$ of $SU(5)$. The embedding of these models in $SU(5)$, along with a flavor $U(1)$ symmetry, addresses the fermion mass hierarchy problem and generates naturally large neutrino mixing angles, while being consistent with all flavor changing processes.

Summary

LHC experiments have provided rather stringent limits on the SUSY particle masses within minimal supergravity. Such limits are not easily obtained for the class of gauge mediated SUSY breaking models, primarily because these models predict rather low Higgs boson mass ($m_h < 118$ GeV for SUSY particles below 2 TeV). The present work gives a consistent scenario where m_h is raised to about 126 GeV within minimal GMSB, even with sub-TeV SUSY particles.

Author: Prof. BABU, Kaladi S. (Oklahoma State University (US))

Presenter: Prof. BABU, Kaladi S. (Oklahoma State University (US))

Session Classification: Room 219 - Beyond the Standard Model SUSY / Non-SUSY - TR2&3

Track Classification: Track 2 - Beyond the Standard Model - SUSY