Contribution ID: **75** Type: **Parallel Session talk**

The Higgs boson mass and SUSY spectra in 10D magnetized SYM theory

Thursday 29 May 2014 17:20 (20 minutes)

In a previous work [1], we constructed a phenomenological model based on the 10D Supersymmetric Yang-Mills theory with magnetic fluxes in extra dimensional space. We compactified the 10D SYM theory on three factorizable tori and introduced the magnetic fluxes preserving only the 4D N=1 SUSY. The magnetic fluxes originate the complicated flavor structures of the standard model, gauge symmetries, three generations, and furthermore, a (semi-) realistic pattern of the masses and mixing angles of the quarks and leptons is obtained without fine-tunings.
In this talk, we are focusing on the 126 GeV Higgs boson, but it depends on the low scale SUSY spectra through loop corrections. We can consider two types of SUSY breaking mediation mechanisms in this model straightforward, the moduli and anomaly mediations. We study the precise SUSY spectra at the low energy scale induced by them. Furthermore, we estimate the Higgs boson mass via the SUSY spectra.

[1]H. Abe, T. Kobayashi, H. Ohki, A. Oikawa and K. Sumita, Nucl. Phys. B 870 (2013) 30
[arXiv:1211.4317 [hep-ph]]

Summary

In our model, there are seven moduli and they all can contribute to the SUSY breaking mediations, but it is just one of them that can induces the gaugino masses as well as the soft scalar masses and A-terms. We define the magnitude of the SUSY breaking mediated by the one as a typical SUSY breaking scale.
We have studied the simplest case with the single moduli and anomaly mediations. As a result, we can obtain the 126 GeV Higgs boson when the typical breaking scale is about 2.0 TeV, and then, we get the two typical SUSY spectra. The first one is induced by the single moduli contribution and the comparable anomaly contribution, where the TeV scale mirage scenario is realized and the fine-tuning relating to "the little hierarchy" will be relaxed better than 1.0 percent. The other one induced by only the moduli is a mini-split SUSY like spectrum. Both are in sub-TeV scale but can be reached at the LHC in the near future.
In addition, we have also studied the model with the other moduli contributions. We find that various experimental results other than the 126 GeV Higgs boson, especially the SUSY flavor violations, restrict the dynamics of the moduli. Consequently, we can derive clues to the moduli stabilization scenario.

Author: Mr SUMITA, Keigo (Waseda Universary)

Co-authors: Prof. ABE, Hiroyuki (Waseda University); Mr KAWAMURA, Junichiro (Waseda Universary)

Presenter: Mr SUMITA, Keigo (Waseda Universary)

Session Classification: Formal

Track Classification: String Theory