



Contribution ID: 31

Type: Parallel talk

## Probing Non-holomorphic MSSM via precision constraints, dark matter and LHC data

*Tuesday, 20 June 2017 15:30 (15 minutes)*

We explore the phenomenological constraints of models with non-holomorphic soft SUSY breaking terms in a beyond the MSSM scenario having identical particle content. The model referred as NHSSM shows various promising features like the possibility of a strong reduction in electroweak fine-tuning even for a scenario of a heavy higgsino type of LSP, a fact that is unavailable in pMSSM models. The other important aspect is satisfying the muon  $g-2$  data even for a small  $\tan\beta$  via a small value of coupling  $A'\mu$  associated with the tri-linear non-holomorphic soft term. Thus, a large SUSY contribution to muon  $g-2$  is possible even for a significantly large smuon mass  $m_{\mu\tilde{1}}$ . The Higgs mass radiative corrections are contributed by both the holomorphic and non-holomorphic trilinear soft parameters  $A_t$  and  $A'_t$ , thus diluting the requirement to have a larger  $A_t$  to satisfy the Higgs mass data. The model also provides with valid parameter space satisfying the constraint of  $B \rightarrow Xs + \gamma$  for large values of  $\tan\beta$ , a scenario unfavourable in pMSSM. We will further discuss the effect of considering appropriate SUSY breaking mechanisms.

### Presentation type

Parallel talk

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