Contribution ID: **124** Type: **Non-Invited Talk**

SUSY-Collider and DM searches

Wednesday 28 November 2018 16:55 (25 minutes)

We present the current perspectives for SUSY at the LHC Run-II and at future colliders, as well as the current perspectives for SUSY Dark Matter in light of current and future direct detection experiments,in a phenomenological, Minimal Supersymmetric Standard Model with eleven parameters (pMSSM11) and in the subGUT-CMSSM.
The subGUT-CMSSM is a CMSSM-like scenario where the input scale, M_{in}, of the unified soft SUSY-breaking terms is treated as an additional free parameter in the sampling instead of being assumed to be the GUT scale.
Our study includes the most important limits on SUSY coming from searches at runs 1 and 2 of the LHC, as well as the compatibility with the observed
Higgs signal and the constraints coming from precision data and flavor physics. Cosmological data and direct searches for dark matter are also taken into account.
Particular attention has been given to the impact of the constraint muon anomalous magnetic moment constraint
in determining the allowed mass range for the neutralino and in turn to how this impacts the typical signatures of superpartners production at the LHC.

We have found that the prospects for a discovery of strongly interacting sparticles at the LHC remain strong, with a rich phenomenology
of possible signatures, especially in the pMSSM11. Electroweakino production will be on the other hand more efficiently probed at future lepton colliders.

As for dark matter searches, we have found that the preferred nature of the neutralino in the pMSSM11 can change from being a bino-like LSP, with a mass of O(100 GeV) to a Higgsino-like LSP
with a mass of O(1 TeV). In the subGUT-CMSSM the neutralino is preferred to be either bino- or Higgsino-like, in both cases with a mass of O(1 TeV).
Future DM direct-detection experiments will be able to probe significantly the parameter spaces of both scenarios, in a complementary way with
respect to collider searches.

This contribution is based on Eur.Phys.J. C78 (2018) no.2, 158 and Eur.Phys.J. C78 (2018) no.3, 256. It will be presented by one of the members of the collaboration.

Content of the contribution

Both

Author: LUCIO MARTINEZ, Miriam (Universidade de Santiago de Compostela (ES))

Presenter: LUCIO MARTINEZ, Miriam (Universidade de Santiago de Compostela (ES))

Session Classification: Supersymmetry

Track Classification: [6] Supersymmetry