



Contribution ID: 71

Type: **not specified**

Is light neutralino thermal DM ruled out in the PMSSM?

Monday, 18 December 2023 11:30 (40 minutes)

We have explored the parameter space for the phenomenological minimal supersymmetric standard model (PMSSM) with specific focus on the region with a light neutralino dark matter (with mass less than half the mass of the Higgs), which is consistent with current collider and astrophysical constraints. We show that the latest results from the LHC searches for sparticles and direct detection constraints from XENON and LUX-ZEPLIN, basically rule out all the region for positive sign of the Higgsino mass parameter μ whereas for the negative sign only a very narrow region with light electro-weakinos is allowed. We further show that it should be possible to explore this region conclusively in the Run-3 of the LHC. We have also studied the impact of a possible light stau on our results

Institution

Designation

Faculty

Reference publication/preprint

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Session Classification: Plenary