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Study of dark matter physics in the non-universal gaugino mass scenario

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We study dark matter physics in the Minimal Supersymmetric Standard Model
with non-universal gaugino masses at the unification scale.
In this scenario, the specific ratio of wino and gluino masses
realizes the electro-weak scale naturally and achieve the 125 GeV Higgs mass.
Then, relatively light higgsinos are predicted
and the neutral component is a good dark matter candidate.
The direct detection of the dark matter
are sensitive to not only a higgsino mass
but also gaugino masses significantly.
The upcoming XENON1T experiment excludes parameter region where
the bino or the gluino is lighter than about 2.5 TeV
if the higgsino and the gaugino mass parameters have a same sign
and the observed dark matter abundance is explained
by the thermal freeze-out mechanism. The limit for the gluino mass is tightened
for the lighter bino and higgsino,
while it becomes much weaker
if the higgsino and the gaugino mass parameters have opposite signs.
We have studied the Higgs mass and the LHC phenomenology
of this scenario in arXiv:1208.5328, 1505.03729, 1601.03484.
The dark matter physics is discussed in my Ph.D thesis,
but the paper with more complete results is in preparation and coming soon.

Presentation type

Parallel talk

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