

Probing Minimal SUSY Scenarios in the light of Muon $g-2$ and DM

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Motivations for $O(100)$ GeV SUSY

After the LHC 13 TeV, SUSY is still not yet discovered...

But SUSY is still attractive for

1. Neutralino DM

100 GeV – 1 TeV **Neutralino** explains DM by its thermal relic

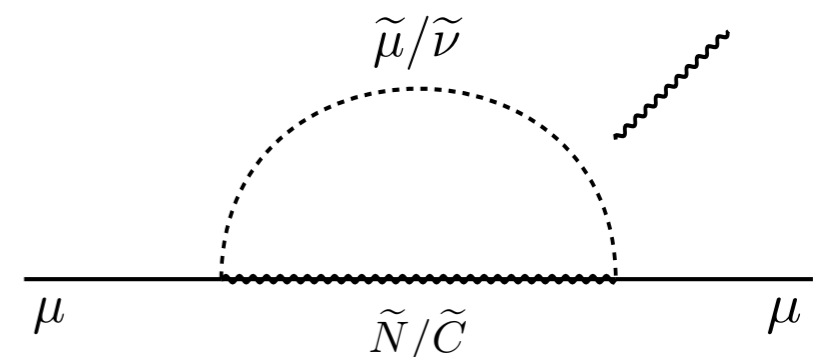
XENON1T are now pushing the constraint on DM - nucleon cross section

2. Muon $g-2$ discrepancy

$$a_{\mu}(\text{exp}) - a_{\mu}(\text{SM}) = (26.1 \pm 8.0) \times 10^{-10}$$

$O(100)$ GeV **neutralino/chargino/smuon** necessary

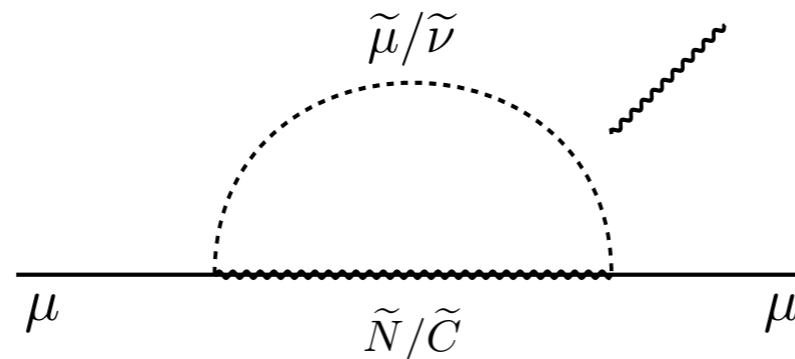
New experiment at the BNL this winter will reduce the Exp. uncertainty by factor 4



- ▶ New experimental results will be presented soon
- ▶ It is good time to study whether SUSY can **simultaneously** solve DM and Muon $g-2$
- ▶ We study experimental **prospects** on such scenarios comprehensively
- ▶ We perform **bottom-up analysis** within MSSM

Classification of minimal scenarios to solve DM and muon $g-2$ *simultaneously*

- ▶ Solving muon $g-2$ discrepancy requires at least **3 SUSY multiplets**



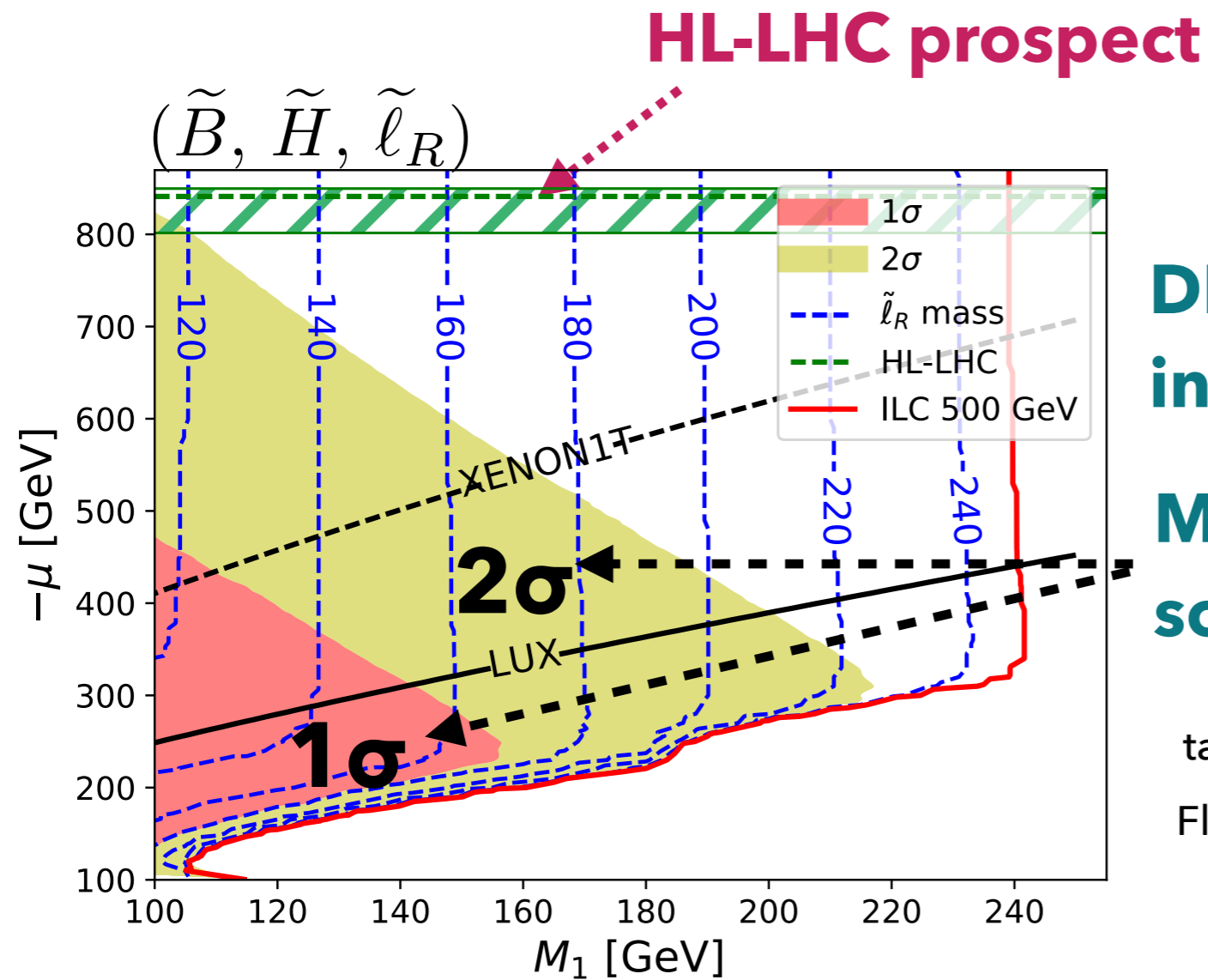
4 minimal scenarios

	BHR	BHL	BLR	WHL
Multiplets	$\tilde{B}, \tilde{H}, \tilde{\ell}_R$	$\tilde{B}, \tilde{H}, \tilde{L}$	$\tilde{B}, \tilde{L}, \tilde{\ell}_R$	$\tilde{W}, \tilde{H}, \tilde{L}$
DM candidates	\tilde{B}, \tilde{H}^0	\tilde{B}, \tilde{H}^0	\tilde{B}	\tilde{W}^0, \tilde{H}^0

We study BHR and BHL

Cannot solve simultaneously

Results1



**DM abundance is explained
in whole space**

**Muon g-2 discrepancy is
solved here**

$\tan\beta=40$

Flavor universal slepton mass

HL-LHC and XENON1T can probe almost all the parameter space!

For details, please see my poster