

# Neutrino Masses from a Hybrid Type I + III Inverse Seesaw Mechanism in $U(1)_{R-L}$ -symmetric MSSM

Saturday 20 July 2024 11:15 (15 minutes)

We show that, in a  $U(1)_{R-L}$ -symmetric SUSY model, the pseudo-Dirac bino and wino can give rise to three light neutrino masses through effective operators, generated at the messenger scale between a SUSY breaking hidden sector and the visible sector. The neutrino-bino/wino mixing follows a hybrid type I+III inverse seesaw pattern. The light neutrino masses are governed by the ratio of the  $U(1)_{R-L}$ -breaking gravitino mass,  $m_{3/2}$ , and the messenger scale  $\Lambda_M$ . The charged component of the  $SU(2)_L$ -triplet, here the lightest charginos, mix with the charged leptons and generate FCNC at tree level. We find that resulting LFV observables yield a lower bound on the messenger scale,  $\Lambda_M$

$gtrsim(500 - 1000)$  TeV for a simplified hybrid mixing scenario. We identify interesting mixing structures for certain  $U(1)_{R-L}$ -breaking singlino/tripletino Majorana masses. We describe the rich collider phenomenology expected in this neutrino-mass generation mechanism.

## Alternate track

1. Beyond the Standard Model

## I read the instructions above

Yes

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