ICHEP 2022



Contribution ID: 1338

Type: Parallel Talk

Measuring neutrino dynamics in NMSSM with a right-handed sneutrino LSP at the ILC

Saturday, 9 July 2022 16:00 (15 minutes)

We study the possibility of measuring neutrino Yukawa couplings in the Next-to-Minimal Supersymmetric Standard Model with right-handed neutrinos (NMSSMr) when the lightest rightsneutrino is the Dark Matter (DM) candidate, by exploiting a 'dijet + dilepton + Missing Transverse Energy' (MET) signature. We show that, contrary to the minimal realisation of Supersymmetry (SUSY), the MSSM, wherein the DM candidate is typically a much heavier (fermionic) neutralino state, this extended model of SUSY offers one with a much lighter (bosonic) state as DM that can then be produced at the next generation of e+e- colliders with energies up to 500 GeV or so. The ensuing signal, emerging from chargino pair production and subsequent decay, is extremely pure so it also affords one with the possibility of extracting the Yukawa parameters of the (s)neutrino sector. Altogether, our results serve the purpose of motivating searches for light DM signals at such machines, where the DM candidate can have a mass around the Electro-Weak (EW) scale.

In-person participation

No

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Presenter: LIU, Yi

Session Classification: Beyond the Standard Model

Track Classification: Beyond the Standard Model