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

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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 right-handed sneutrino is the Dark Matter (DM) candidate by exploiting a 'dijet + dilepton + Missing Transverse Energy' (MET or $slashed E_T$) signature. We show that this extended model of SUSY offers 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 energing 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 scale.

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