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Revisiting sneutrino dark matter in natural SUSY scenarios

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We study natural supersymmetric scenarios with light right-handed neutrino superfields, and consider the possibility of having a sneutrino as a dark matter candidate. We consider thermal and nonthermal production, taking into account freeze-out, freeze-in, and super-WIMP mechanisms. For the nonthermal case, we find that the R-sneutrino can reproduce the observed relic density by adjusting their mass and Yukawa couplings. For the thermal case, we find the need to extend the model in order to enhance sneutrino annihilations, which we exemplify in a model with an extended gauge symmetry.

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