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The lightest neutralino in the Minimal Non-minimal Supersymmetric Standard model

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We study the neutralino sector of the Minimal Non-minimal Supersymmetric Standard Model (MNSSM) where the μ problem of the Minimal Supersymmetric Standard Model (MSSM) is solved without accompanying problems related with the appearance of domain walls. In the MNSSM as in the MSSM the lightest neutralino can be the absolutely stable lightest supersymmetric particle (LSP) providing a good candidate for the cold dark matter component of the Universe. In contrast with the MSSM the allowed range of the mass of the lightest neutralino in the MNSSM is limited. We establish the theoretical upper bound on the lightest neutralino mass in the framework of this model and obtain an approximate solution for this mass. Finally, cross sections for associated production of this particle at the ILC are presented.

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