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Probing a bino NLSP at lepton colliders

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We consider a scenario where light bino is the next-to-lightest supersymmetric particle (NLSP) and gravitino/axino is the lightest supersymmetric particle (LSP). For a bino mass less than or around hundred GeV, it can be pair produced at the future lepton colliders through t -channel slepton exchange, subsequently decaying into a gravitino/axino plus a photon. We study the prospects to look for such binos at the future colliders and find that a bino mass around 100 GeV can be probed at the 2σ (5σ) level for a slepton below 2 TeV (1.5 TeV) with a luminosity 5.6 ab^{-1} . For a bino mass around 10 GeV, a slepton mass less than 4.5 TeV (3.5 TeV) can be probed at the 2σ (5σ) level, which is much beyond the reach of the LHC for direct slepton searches.

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