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## Gravitino LSP and long-lived staus at the LHC

We present the phenomenology of the gravitino dark matter scenario at the large hadron collider (LHC) experiment. We consider the case that the next-to-lightest supersymmetric particle (NLSP) is the lighter stau. For a wide range of gravitino masses the lighter stau is stable on the scale of a detector. Such a particle will give rise to a prominent signature as a 'slow muon'. The dominant production channel of staus depends strongly on the hierarchy of the mass spectrum. However, the direct production (via the Drell-Yan process) is always present and independent of the remaining spectrum and thus sets a lower bound on the discovery potential of this scenario. In a careful analysis we show that this scenario will be found in the long-term LHC run for almost all reasonable assumptions for the mass spectrum including very high mass spectra as motivated from big bang nucleosynthesis (BBN) constraints.

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