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Hunting the Supersymmetric Dark Matter with taus

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Supersymmetry is one of the best-motivated proposals for physics beyond the Standard Model. One of the primary motivations for the supersymmetry rests on the observation that the LSP (lightest supersymmetric particle) in R-parity conserving models is massive, naturally neutral and stable. This synergy of properties casts the LSP as an excellent candidate for the dark matter (DM). The stau (superpartner of the 3rd-generation fermion ⊠) is predicted to be relatively light in various SUSY scenarios and models with light staus can lead to a dark-matter relic density consistent with the cosmological observations. Decay of staus leads to ⊠-rich final states with LSP appearing as missing transverse momentum (MET) in the system. Therefore, we explore the possibility of DM production at LHC in the final states with tau+MET+jets events. This talk reports on the MET trigger efficiency and signal optimization studies for Squarks/Gluinos production in the framework of simplified models.

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