



Contribution ID: 108

Type: Talk

Investigating light NMSSM pseudoscalar states with boosted ditau tagging

Tuesday 5 July 2016 17:30 (20 minutes)

We study a class of realizations of the Next-to-Minimal Supersymmetric Standard Model that is motivated by dark matter and Higgs data, and in which the lightest pseudoscalar Higgs boson mass is smaller than twice the bottom quark mass and greater than twice the tau lepton mass. In such scenarios, the lightest pseudoscalar Higgs boson can be copiously produced at the LHC from the decay of heavier superpartners and will dominantly further decay into a pair of tau leptons that is generally boosted. We make use of a boosted object tagging technique designed to tag such a ditau jet, and estimate the sensitivity of the LHC to the considered supersymmetric scenarios with 20 to 50 fb^{-1} of proton-proton collisions at a center-of-mass energy of 13 TeV.

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Session Classification: Experimental and Collider Aspects of SUSY

Track Classification: Experimental and Collider Aspects of SUSY