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Exploring tau lepton pairs from Higgs at the LHC

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We study a noble approach in reconstructing the semi-invisible events by utilizing the constrained mass variable, M_{2Cons} and applied so in case of presently developing scenario, when a pair of the third generation τ leptons originated from Higgs at LHC. Buoyed with a relatively large Yukawa coupling, the LHC has already started exploring this pair production to investigate the properties of Higgs in the leptonic sector. Dominant signatures through hadronic decay of tau, associated with invisible neutrinos compound the difficulty in the reconstruction of such events. Exploiting the already existing Higgs mass bound, the proposed method provides a unique event reconstruction and results in a significant enhancement in efficiency over the existing methods. After reconstructing the semi-invisible tau lepton pair events, we also study the CP properties of Higgs using tau-lepton momentum correlations.

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