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Prompt tau neutrinos at the LHC

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We investigate tau neutrinos from heavy flavor hadrons (prompt neutrinos) that can be explored at a high rapidity LHC experiment. A large number of tau neutrinos can be produced in pp collision at the LHC in the very forward region (y>6.5), where its main source is Ds mesons since the weak boson contribution is negligible. Abundant production of tau neutrinos will allow the precise study of tau neutrino charged current interactions, which can be used to test lepton universality. In addition, it will provide the opportunity to probe the mixing between the sterile neutrinos and tau neutrinos. We present a prediction of the fluxes and the event rates of the prompt tau neutrinos as well as muon neutrinos focusing on the configuration of FASER, a recently approved experiment. Also, we describe the sterile neutrino masses and mixing angles that can be constrained by tau neutrinos from the LHC.

Working Group

WG5 : Neutrinos Beyond PMNS

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