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Searching for heavy neutral leptons using τ decays at BABAR

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This talk presents a model independent search for an additional heavy, mostly sterile, neutral lepton (HNL) which is capable of mixing with the Standard Model tau neutrino with a mixing strength of $|\tau 4|2$, corresponding to the square of the extended Pontecorvo–Maki–Nakagawa–Sakata (PMNS) matrix element. HNLs are hypothetical particles predicted by many beyond Standard Model theories, which can explain oscillation anomalies as well as the baryon asymmetry in the universe through leptogenesis. HNLs can also provide dark matter candidates. We search for HNL production in the decays of the tau lepton analyzing a data set from the $BABAR$ experiment, with a total integrated luminosity of 424 fb^{-1}. A kinematic approach is taken and no assumptions are made regarding the model behind the origins of the HNL, its lifetime or decay modes.

Category

talk

Primary author: PATRIGNANI, Claudia (Universita' and INFN Bologna)

Presenter: PATRIGNANI, Claudia (Universita' and INFN Bologna)

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