



LHC Seminar

SPEAKER: Lesya Shchutska

TITLE: **Search for heavy neutral leptons in the trilepton final state at CMS**

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ABSTRACT

The smallness of neutrino masses provides a tantalizing allusion to physics beyond the standard model (SM). Heavy neutral leptons (HNL), such as hypothetical sterile neutrinos, provide a potential explanation of this observation through the see-saw mechanism. If they exist, HNL could also provide answers about the underlying nature of dark matter as well as the observed baryon asymmetry in the universe. A search for the production of HNL at the LHC, originating from leptonic W boson decays through the mixing of the HNL with SM neutrinos, is presented in this seminar. The search focuses on signatures with three prompt leptons (electrons or muons) in the final state, which allow to probe the production of the HNL with masses ranging from 1 GeV up to 1.2 TeV. Using 36/fb of proton-proton collision data collected by CMS in 2016, the analysis is optimized for finding HNL with masses above and below that of the W boson.