Contribution ID: **1520** Type: **Poster**

Search for long-lived heavy neutral leptons decays to lepton and a jet from a displaced vertex at CMS

Thursday 18 July 2024 20:45 (15 minutes)

The discovery of neutrino oscillations has provided experimental evidence that neutrinos have nonzero masses. Cosmological constraints as well as direct measurements indicate that the neutrino masses are orders of magnitude smaller than the masses of other SM fermions. The introduction of new heavy states, N, with right-handed chirality, known as heavy neutral leptons (HNLs), is a possible beyond the Standard Model (BSM) mechanism for providing nonzero masses to neutrinos. The HNLs can generate a gauge invariant mass term for the SM neutrinos through a see-saw mechanism. Additionally, HNLs can provide explanations for other problems in high energy physics like the nature of dark matter or the matter-antimatter asymmetry of the universe. This poster presents the search for long-lived HNLs, both as possible right-handed Dirac or Majorana scenarios. The search is conducted using final states that contain two charged leptons (electrons or muons) and a jet from a displaced vertex.

Alternate track

I read the instructions above

Yes

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Session Classification: Poster Session 1

Track Classification: 03. Beyond the Standard Model