

Add to Marked List

1 of 1

Search for Heavy Neutral Leptons in Events with Three Charged Leptons in Proton-Proton Collisions at root s=13 TeV

By: [Sirunyan, AM](#) (Sirunyan, A. M.)^[1]; [Collaboration, C](#) (Collaboration, C. M. S.)^[1]; [Tumasyan, A](#) (Tumasyan, A.)^[2]; [Adam, W](#) (Adam, W.)^[2]; [Ambrogi, F](#) (Ambrogi, F.)^[2]; [Asilar, E](#) (Asilar, E.)^[2]; [Bergauer, T](#) (Bergauer, T.)^[2]; [Brandstetter, J](#) (Brandstetter, J.)^[2]; [Brondolin, E](#) (Brondolin, E.)^[2]; [Dragicevic, M](#) (Dragicevic, M.)^[2] ...[More](#)
[View ResearcherID and ORCID](#)

PHYSICAL REVIEW LETTERS

Volume: 120 Issue: 22
 Article Number: 221801
 DOI: 10.1103/PhysRevLett.120.221801
 Published: MAY 29 2018
 Document Type: Article

Abstract

A search for a heavy neutral lepton N of Majorana nature decaying into a W boson and a charged lepton is performed using the CMS detector at the LHC. The targeted signature consists of three prompt charged leptons in any flavor combination of electrons and muons. The data were collected in proton-proton collisions at a center-of-mass energy of 13 TeV, with an integrated luminosity of 35.9 fb⁻¹. The search is performed in the N mass range between 1 GeV and 1.2 TeV. The data are found to be consistent with the expected standard model background. Upper limits are set on the values of $|V_{eN}|$ and $|V_{\mu N}|$, where V_{lN} is the matrix element describing the mixing of N with the standard model neutrino of flavor l . These are the first direct limits for N masses above 500 GeV and the first limits obtained at a hadron collider for N masses below 40 GeV.

Keywords

KeyWords Plus: [E\(+\)/E\(-\) ANNIHILATION](#); [DARK-MATTER](#); [MASSES](#); [NEUTRINOS](#); [DECAYS](#); [BEAM](#); [OSCILLATIONS](#); [BARYOGENESIS](#); [VIOLATION](#); [TEVATRON](#)

Author Information

Reprint Address: Sirunyan, AM (reprint author)

+ Yerevan Phys Inst, Yerevan, Armenia.

Addresses:

- + [1] Yerevan Phys Inst, Yerevan, Armenia
- + [2] Inst Hochenergiephys, Vienna, Austria
- + [3] Inst Nucl Problems, Minsk, BELARUS
- + [4] Univ Antwerp, Antwerp, Belgium
- + [5] Vrije Univ Brussel, Brussels, Belgium
- + [6] Univ Libre Bruxelles, Brussels, Belgium
- + [7] Univ Ghent, Ghent, Belgium
- + [8] Univ Catholica Louvain, Louvain La Neuve, Belgium
- + [9] Ctr Brasileiro Pesquisas Fis, Rio De Janeiro, Brazil
- + [10] Univ Estado Rio de Janeiro, Rio De Janeiro, Brazil
- + [11] Univ Estadual Paulista, Sao Paulo, Brazil
- + [12] Univ Fed ABC, Sao Paulo, Brazil
- + [13] Bulgarian Acad Sci, Inst Nucl Res & Nucl Energy, Sofia, Bulgaria
- + [14] Univ Sofia, Sofia, Bulgaria
- + [15] Beihang Univ, Beijing, Peoples R China
- + [16] Inst High Energy Phys, Beijing, Peoples R China
- + [17] Peking Univ, State Key Lab Nucl Phys & Technol, Beijing, Peoples R China
- + [18] Tsinghua Univ, Beijing, Peoples R China
- + [19] Univ Los Andes, Bogota, Colombia

- [20] Univ Split, Fac Elect Engr Mech Engr & Naval Architecture, Split, Croatia
- [21] Univ Split, Fac Sci, Split, Croatia
- [22] Inst Rudjer Boskov, Zagreb, Croatia
- [23] Univ Cyprus, Nicosia, Cyprus
- [24] Charles Univ Prague, Prague, Czech Republic
- [25] Univ San Francisco Quito, Quito, Ecuador
- [26] Acad Sci Res & Technol Arab Republ Egypt, Egyptian Network High Energy Phys, Cairo, Egypt
- [27] NICPB, Tallinn, Estonia
- [28] Univ Helsinki, Dept Phys, Helsinki, Finland
- [29] Helsinki Inst Phys, Helsinki, Finland
- [30] Lappeenranta Univ Technol, Lappeenranta, Finland
- [31] Univ Paris Saclay, CEA, IRFU, Gif Sur Yvette, France
- [32] Univ Paris Saclay, CNRS, IN2P3, Lab Leprince Ringuet Ecole Polytech, Palaiseau, France
- [33] Univ Strasbourg, CNRS, IPHC UMR 7178, F-67000 Strasbourg, France
- [34] CNRS, Ctr Calcul Inst Natl Phys Nucl & Phys Particules, IN2P3, Villeurbanne, France
- [35] Univ Lyon, Univ Claude Bernard Lyon 1, CNRS IN2P3, Inst Phys Nucl Lyon, Villeurbanne, France
- [36] Georgian Tech Univ, Tbilisi, Rep of Georgia
- [37] Tbilisi State Univ, Tbilisi, Rep of Georgia
- [38] Rhein Westfal TH Aachen, Phys Inst 1, Aachen, Germany
- [39] Rhein Westfal TH Aachen, Phys Inst A 3, Aachen, Germany
- [40] Rhein Westfal TH Aachen, Phys Inst B 3, Aachen, Germany
- [41] Deutsch Elekt Synchrotron, Hamburg, Germany
- [42] Univ Hamburg, Hamburg, Germany
- [43] Inst Expt Teilchenphys, Karlsruhe, Germany