

Search for Type-III SeeSaw heavy leptons in multileptonic final states using 139/fb of pp collision at $\sqrt{s} = 13$ TeV with the ATLAS detector

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The discovery of neutrino oscillations implies they have non-null masses much smaller than charged leptons. This is difficult to accommodate in a natural way through a pure Standard Model Yukawa coupling to the Higgs field. Type-III SeeSaw mechanism is a proposed beyond the SM model, introducing at least two new triplets of fermionic fields with zero hypercharge in the adjoint representation of SU(2)_L, resulting in two heavy Dirac charged leptons and an heavy Majorana neutral lepton. I'll present the search for these heavy leptons in multileptonic final states using the data collected by ATLAS detector at $\sqrt{s} = 13$ TeV with a integrated luminosity of 140/fb corresponding to the full Run-2 dataset recorded between 2015-2018. The analysis includes all the possible production and boson decay channels of these heavy leptons, which are assumed to be degenerate in mass. The search is optimized for each lepton multiplicity final state, considering 2, 3 and 4 leptons. The power of the considered semi-leptonic channels lies in the low expected background from Standard Model processes. The result of this search will be a cross section exclusion limit placing a lower bound to the heavy leptons mass obtained with a 95% CL.

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