



Contribution ID: 563

Type: Poster

Testing triplet fermions at the electron-positron and electron-proton colliders using fat jet signatures

The addition of $SU(2)_L$ triplet fermions of zero hypercharge with the Standard Model helps to explain the origin of the neutrino mass by the so-called seesaw mechanism. Such a scenario is commonly known as the type-III seesaw model. After the electroweak symmetry breaking, the mixings between the light and heavy mass eigenstates of the neutral leptons are developed, which play important roles in the study of the charged and neutral multiplets of the triplet fermions at the colliders. In this poster, we study such interactions to produce these multiplets of the triplet fermion at the e^-e^+ collider. We focus on the heavy triplets, e.g., having mass in the TeV scale so that their decay products, including the SM gauge bosons or Higgs boson, can be sufficiently boosted, leading to a fat jet. Hence, we probe the mixing between light-heavy mass eigenstates of the neutrinos and compare the results with the bounds obtained by the electroweak precision study.

Mini-abstract

Heavy triplet fermion search with fat jet at the linear collider

Experiment/Collaboration

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Session Classification: Poster session 3