Contribution ID: **368** Type: **Oral Presentation**

New mechanism for light neutrino mass generation and its LHC signals

Wednesday, 31 July 2019 15:10 (20 minutes)

we revisit the dimension-7 neutrino mass generation mechanism based on the addition of an isospin 3/2 scalar quadruplet and two vectorlike isotriplet leptons to the standard model. We discuss the LHC phenomenology of the charged scalars of this model, complemented by the electroweak precision and lepton flavor violation constraints. We pay particular attention to the triply charged and doubly charged components. We focus on the same-sign-trilepton signatures originating from the triply charged scalars and find a discovery reach of 600–950 GeV at 3 ab−1 of integrated luminosity at the LHC. Strong constraints on the model parameter space can arise from the measured decay rate of the standard model Higgs to a pair of photons as well.

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Session Classification: Neutrino Physics

Track Classification: Neutrino Physics