

MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

Contribution ID: 102

Type: Presentation

Dimension 7 neutrino mass generation and its implications for the LHC and the dark matter

Wednesday, 2 August 2017 11:39 (18 minutes)

Neutrino mass generation by the effective dimension seven operators leads to a different seesaw relation, $m_nu \sim v^3 / M^2$ compared to the usual seesaw one, $m_nu \sim v^2 / M$. The model [1] incorporating this has an isospin 3/2 scalar multiplet along with iso-triplet leptons, both of which can be at the TeV scale. The model can accommodate the neutrino masses and mixings, and both the direct and indirect mass hierarchy. The isospin 3/2 scalar contains triply charged scalar particles, and can be produced at the LHC via the Drell-Yan as well as photon fusion. Depending on the induced VEV of the isospin 3/2, the triply charged scalar can decay immediately, or produce displaced vertex. The final states give rise to same sign di-leptons, as well as trileptons, and can be observed at the LHC in the current or upcoming runs [2]. The model also has interesting implications for the dark matter detection experiments [3].

- 1. New mechanism for neutrino mass generation, and triply charged Higgs boson at the LHC, K. S. Babu, S. Nandi and Z. Tavartkiladze: Phys. Rev. D80:071702, 2009.
- 2. Neutrino mass and scalar singlet dark matter, S. Bhattacharya, S. Jana, S. Nandi, e-Print arXiv: 1609.03274[hep-ph], Phys. Rev. D 95(2017) no5, 055003.
- 3. Neutrino mass generation at the TeV scale and new physics signatures from the charged Higgs for photon initiated processes, Kirtiman Ghosh, Sudip Jana and S. Nandi, e-Print: arXiv: 1705.01121[hep-ph].

Primary author: Prof. NANDI, Satyanarayan (Oklahoma State University)

Co-authors: BABU, K.S. (Oklahoma State University); GHOSH, Kirtiman (Institute of physics, Bhubaneswar, India); JANA, Sudip (Oklahoma State University); TAVARTKILADZE, Zurab (Ilia State University)

Presenter: Prof. NANDI, Satyanarayan (Oklahoma State University)

Session Classification: Neutrino Physics

Track Classification: Neutrino Physics