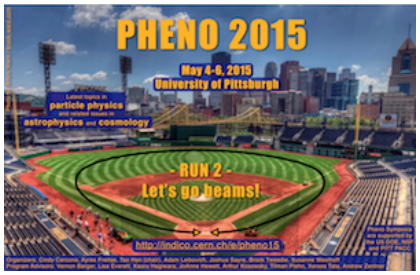

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The improved bounds on the heavy neutrino productions at the 8 TeV LHC

Tuesday 5 May 2015 15:30 (15 minutes)

With the heavy Standard Model (SM) singlet neutrinos, the (inverse) seesaw mechanism provides us with a natural way to incorporate the neutrino mass in the SM.
If the heavy neutrinos have their mass of the electroweak scale, they can be produced at the Large Hadron Collider (LHC) through their mixing with the SM light neutrinos.
We investigate the heavy neutrino production processes at the LHC with a variety of initial states at the parton level, such as quark-quark annihilation, quark-gluon and gluon-gluon fusions, as well as the collision of proton with a photon radiated from the other proton, for the final states including up to two jets.
We simulate signal events for the heavy neutrino productions for both pseudo-Dirac and Majorana cases. Comparing our simulation results with the current CMS and ATLAS data, we obtain the upper bound on the mixing angle between the heavy and SM light neutrinos.
We find that the heavy neutrino production processes associated with two jets yield a sizable contribution to the total heavy neutrino production cross section and therefore, the upper bound on the mixing angle is improved from the one obtained in previous analysis.

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