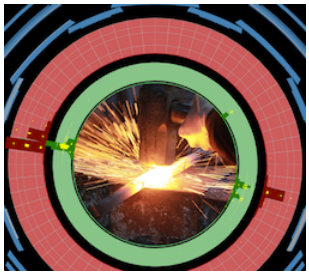

Contribution ID: **109** Type: **parallel talk**

Distinguished LHC signatures of EW scale right-handed 'Fertile' neutrinos

Monday 9 May 2016 15:15 (15 minutes)

Observation of non-zero neutrino masses at a scale $\sim 10^{-1} - 10^{-2}$ eV is a major problem in otherwise highly successful Standard Model. The most elegant mechanism to explain such tiny neutrino masses is seesaw mechanism with right handed neutrinos. However, the required seesaw scale is so high ($\sim 10^{14}$ GeV), it will not have any direct collider implications. Recently, in our explicit model the seesaw mechanism with the right handed 'fertile' neutrinos at the electroweak scale has been investigated. The model has a mirror symmetry having left and right lepton and quark doublets and singlets for the same $SU(2)_W$ gauge symmetry. Additional Higgs multiplets are introduced to satisfy the precision electroweak tests, and other low energy observables. Because the scale of the symmetry breaking is electroweak, both the mirror quarks and mirror leptons have masses in the electroweak scale in the range $\sim 150 - 800$ GeV. The mirror quarks \ leptons decay to SM quarks \leptons and almost massless neutral scalars. We calculate the final state signals arising from the pair productions of these mirror quarks and leptons and their subsequent decays. We find distinguished like-sign di-lepton signals from mirror lepton decays which are well observable over SM background for 13 TeV LHC. Moreover, depending on the associated Yukawa couplings, these decays can also give rise to displaced vertices with long decay length (very different from the usual displaced vertices associated with b decays), which will be the distinguishing signatures to look for in 13 TeV LHC.

Summary

Author: Dr CHAKDAR, Shreyashi (University of Virginia)

Co-authors: Dr GHOSH, Kirtiman (University of Delhi); HUNG, Pham Q. (University of Virginia (US)); NANDI, Satyanarayan (Oklahoma State University); HOANG, vinh (university of virginia)

Presenters: Dr CHAKDAR, Shreyashi (University of Virginia); CHAKDAR, Shreyashi (oklahoma state university)

Session Classification: BSM I