

Growing Evidence for a Higgs Triplet

Despite intensive searches at the LHC, no new fundamental particle has been discovered since the discovery of the 125 GeV Higgs boson. However, several recent LHC searches with multiple leptons in the final state point towards the existence of a new Higgs boson with a mass in the 140-160 GeV range, decaying mostly to a pair of W bosons. This dominant decay mode motivates a Higgs triplet with zero hypercharge, which also predicts a heavier-than-expected W-boson as indicated by the CDF-II measurement. Therefore, we study this model and use it to explain the recent excesses in the associated di-photon production analysis of ATLAS using Run 2 data. Based on this analysis, we obtain a significance of 4.3 sigma for a new Higgs boson of mass 152 GeV.

Author: BANIK, Sumit (University of Zurich & PSI)

Presenter: BANIK, Sumit (University of Zurich & PSI)