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【365】Growing Evidence for a Higgs Triplet at the LHC

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Several 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. Within this simple and predictive model, we simulate and combine channels of associated di-photon production. Considering the run-2 results of ATLAS, a significance of 4.3 sigma is obtained for a mass of 152 GeV. This is the largest statistical evidence for a new narrow resonance observed at the LHC.

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