Contribution ID: **21** Type: **not specified**

Results of the search for an A boson decaying to Zh, with an lltautau final state, in pp collisions at 8 TeV centre of mass energy recorded with the ATLAS experiment

Thursday 12 February 2015 15:00 (20 minutes)

The neutral CP-dd boson A is predicted by many models with an extended Higgs sector. Searching for the A boson in the sensitive Zh decay, where h is assumed to be the LHC discovered Higgs boson, within the mass range of 220-1000 GeV offers a gateway to find physics beyond the Standard Model. A search for a gluon-fusion-produced A in the decay to Zh, with a final state of two light leptons and two tau leptons, is conducted with 20.3 fbˆ(-1) of proton-proton collision data at 8 TeV CME. The data driven background estimations, background reduction techniques and systematic uncertainty calculations are presented. Upper limits on the cross section times branching ratio of the A boson decaying to lltautau are set for various 2 Higgs Doublet Model (2HDM) scenarios. Where no excess is observed, exclusion limits are set on ranges of the 2HDM phase-space.

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