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## Search for the Standard Model Higgs boson to $WW$ with a hadronic tau channel

Thursday, 14 July 2011 17:00 (2 hours)

In the large mass region, the dominant decay mode of the Higgs boson is to two  $W$  bosons, where the Higgs can be produced via either gluon fusion or vector boson fusion. Of the possible  $W$  decay modes, the current analyses focus on the  $W(\rightarrow l \nu)W(\rightarrow l \nu)$  decay channels where the lepton is either an electron or muon. At a center of mass energy of 7 TeV, the results from the ATLAS detector are combined for each of the three modes  $ee$ ,  $e\mu$ , or  $\mu\mu$ , in order to maximise the signal sensitivity. We investigate the possible sensitivity gained in including a single hadronic tau channel ( $W \rightarrow \tau \nu \rightarrow (\tau_h, a\nu)\nu$ ) in this analysis, and discuss the method in comparison to the standard  $H \rightarrow WW \rightarrow l\nu l\nu$  search. Our work currently focuses on the hadronic tau identification and understanding the jet  $\rightarrow \tau$  fake rate.

**Level (Hons, MSc, PhD, other)?**

PhD

**Consider for a student award (Yes / No)?**

No

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

Yes

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