

# SAIP2014



Contribution ID : 32

## **Search for the 2HDM neutral CP-odd pseudoscalar Higgs, $A$ , in the $A$ to $Zh$ channel in $\sqrt{s} = 8$ TeV $pp$ collisions with multilepton final states using the ATLAS detector**

Thursday 10 Jul 2014 at 15:00 (00h20')

### **Abstract :**

The pseudoscalar Higgs,  $A$ , is a predicted particle of many extensions of the minimal Standard Model, known as Two Higgs Doublet Models (2HDMs), where the Higgs sector is extended to two doublets of scalar fields. The decay for  $A \rightarrow Zh$  includes the Standard Model-like Higgs boson  $h$  in the final state and leads to events with isolated leptons. By assuming that the Standard Model-like Higgs boson  $h$  is the newly discovered Higgs boson with a mass of 125 GeV, we are able to search for the pseudoscalar Higgs at and below the TeV scale. Results of the search for a pseudoscalar Higgs boson in the  $A \rightarrow Zh \rightarrow \ell \ell \tau \tau$  channel, where  $\ell \neq \tau$  and the tau leptons decay hadronically, are presented. Studies on data-driven background estimation methods, signal optimization techniques, and the statistical interpretation of results are shown.

### **Award :**

Yes

### **Level :**

MSC

### **Supervisor :**

Trevor Vickey TrevorVickey@cern.ch University of the Witwatersrand

### **Paper :**

Yes

**Primary authors :** Mr. HAMITY, Guillermo (University of the Witwatersrand)

### **Co-authors :**

**Presenter :** Mr. HAMITY, Guillermo (University of the Witwatersrand)

**Session classification :** NPRP

**Track classification :** Track B - Nuclear, Particle and Radiation Physics

**Type :** Oral Presentation