



HEP 2013  
Stockholm  
18-24 July 2013



Contribution ID: 759

Type: **Poster Presentation**

## Search for the Higgs boson decaying into tau leptons in the semi-leptonic final states

In order to confirm that the new heavy boson discovered in 2012 is the Standard Model Higgs boson, its coupling to fermions must be measured. The CMS collaboration used all the data recorded in 2011 (4.9 /fb) and 2012 (19.1 /fb) from LHC pp collisions at 7 and 8 TeV respectively to perform searches for the Higgs boson decaying to tau pairs : this is the only analysis able to check the coupling of the new boson to leptons. Five different tau decay topologies are analyzed. To increase the sensitivity of the search, each final state is further more splitted into various categories, based on transverse momenta of tau decay products and multiplicity of reconstructed jets. In the semi-leptonic final states (tau decaying to electron/muon + tau decaying to hadrons), the cut on the leptons momenta, guided by the trigger thresholds, removes approximatively half of the signal. In the late 2012 data taking, new online selections allowed to decrease the leptons thresholds, enlarging the phase space available for the analysis. Here we review the motivations of these new online selections, their performances, and we quantify their impact on the di-tau analysis in terms of limits and significances.

**Primary author:** JEITLER, Manfred (Austrian Academy of Sciences (AT))

**Presenter:** Mr DACI, Nadir (Ecole Polytechnique (FR))

**Track Classification:** Higgs and New Physics