



LUND  
UNIVERSITY

Contribution ID: 24

Type: **not specified**

## Charged Higgs searches in ATLAS (12'+3')

*Tuesday 16 October 2018 16:00 (15 minutes)*

It is universally accepted that the Standard Model (SM) is incomplete, and many models that describe physics Beyond the Standard Model (BSM) has by necessity an extended Higgs sector. The smallest extensions add one additional Higgs doublet to the one already present in the SM. These models are collectively called Two Higgs Doublet Models (2HDM). The scalar particle observed in 2012 is then understood to be one of two neutral scalar bosons described by the 2HDM, out of a total of 5 bosons. The remaining 3 are then a neutral pseudo-scalar and a pair of charged scalar bosons.

The observation of such a charged Higgs boson,  $H^\pm$ , would be convincing evidence of BSM physics and numerous direct searches has been carried out by both ATLAS and CMS. For charged Higgs masses below that of the top quark, the dominant decay is to a tau-lepton and a corresponding tau-neutrino. As the mass of the charged Higgs increases, the decay into a top- and a bottom-quark becomes kinematically allowed and quickly becomes the dominant channel. Thus these two decay modes naturally complement each other.

This talk presents the latest ATLAS results from the searches for a charged Higgs boson in the  $\tau\nu$  and  $tb$  decay channels, using  $36.1 \text{ fb}^{-1}$  of proton-proton collision data collected during 2016 and 2017.

**Author:** ISACSON, Max Fredrik (Uppsala University (SE))

**Presenter:** ISACSON, Max Fredrik (Uppsala University (SE))

**Session Classification:** Partikeldagarna 2018