

Abstract

In this report discovery potential of associated production of charged Higgs and W boson is estimated. The dominant production process is $bb \rightarrow H^{+/-} W^{-/+}$ and two final states are investigated which are leptonic final state characterized by the leptonic decay of the W boson and hadronic final state characterized by hadronic decay of W. The charged Higgs decay to tau and a neutrino is considered as its main decay channel. The two regions of light and heavy charged Higgs are studied and 3sigma (evidence) and 5sigma (discovery) contours are shown as a function of the charged Higgs mass and $\tan(\beta)$. This channel has not yet been investigated by CMS and this analysis aims at providing perspective and motivation of studying this channel by CMS

collaboration. Results show that the analysis is suitable for high luminosity run of LHC. However there could be improvements in the results if CMS full lepton and jet identification algorithms are used. The CMS-style analysis of this channel could be reserved for a PhD student.