Contribution ID: **1022** Type: **Parallel**

Detecting Heavy Charged Higgs boson at the LHC

Saturday, July 7, 2018 6:30 PM (15 minutes)

Discovery of charged Higgs boson indicates a clear and unambiguous signal of the beyond standard model. The signal of charged boson is well studied for lower mass range in the dominant $\tau\nu$ decay channel. For higher mass range, signal is difficult to probe because of its predominant decays in
the top and bottom quark. We attempt to investigate the signature of heavy charged Higgs following its decay mode via top and bottom quark, in both hadronic and leptonic final states, where the main dominant standard model backgrounds are from top quark pair and inclusive QCD production. The jet substructure technique is used to reconstruct the top quark in order to avoid the recombinatorial problem. The cut based analysis is performed constructing various kinematic variables, and signal sensitivity is found to be not promising even for high luminosity options due to the huge SM
background cross sections. However, we re analyzed both signal and background employing Multi variate analysis technique. We find an improvement in signal sensitivity in this method. The charged Higgs signal up to the mass of about 500 GeV can be observed with 300 inverse femtobarn(invfb)
integrated luminosity option where as this range can be extended to 800 GeV with 3000 invfb integrated luminosity.

Primary author: GUCHAIT, Monoranjan (Tata Inst. of Fundamental Research (IN))

Presenter: GUCHAIT, Monoranjan (Tata Inst. of Fundamental Research (IN))

Session Classification: Beyond the Standard Model

Track Classification: Beyond the Standard Model