

## Search for Charged Higgs decaying into a top and bottom quark with a single leptonic final state

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Many extensions of the Standard Model include the addition of charged Higgs bosons. The two-Higgs doublet model (2HDM) is one such extension that predicts the presence of charged Higgs bosons. The 2HDM predicts three neutral Higgs bosons along with a positive and negative charged pair of Higgs bosons. In this talk, we present a search for these charged Higgs bosons decaying into a top and bottom quark with single-lepton final states. We perform a multivariable analysis using a Gradient Boosted Decision Tree approach to aid in signal-to-background discrimination. CMS data collected at 13 TeV in 2016 ( $35.9 \text{ fb}^{-1}$ ), 2017 ( $41.5 \text{ fb}^{-1}$ ), and 2018 ( $59.97 \text{ fb}^{-1}$ ) are considered in this search.

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