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Search for doubly charged Higgs-like particles decaying to like sign dimuon pairs with the CMS experiment

Doubly charged Higgs-like particles (H^{++} and H^{-}) are predicted in a variety of BSM models which include the Drell-Yan-like production mechanism, $q \bar{q} \rightarrow Z/\gamma^* \rightarrow H^{++} H^{-}$. Each doubly charged Higgs can decay to a pair of same-sign standard model leptons, producing events with distinctive signatures including electrons, muons, and taus. The most stringent experimental lower bound on the $H^{++/-}$ mass is about 1 TeV from the ATLAS experiment. The first CMS search using Run 2 data is underway using same sign dielectron and dimuon channels. Studies with simulated standard model backgrounds show that events with H^{++} and H^{-} candidates of the same mass are highly suppressed. A control region is established with opposite-sign dilepton pairs with mass less than 500 GeV to test the modeling of standard model backgrounds. The expected sensitivity in $H^{++/-}$ mass is discussed for Run 2 and beyond.

Mini Symposia (Invited Talks Only)

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