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Search for a vector-like quark T decaying to bW, tZ, tH in the single lepton final state at the HL-LHC

Monday 12 December 2022 14:00 (1 hour)

A simulation-based projection study has been performed for a search for a vector-like top quark partner T in proton-proton (pp) collisions at $\sqrt{s}$ = 14 TeV. The search considers the operational conditions of the High-Luminosity LHC (HL-LHC). The production pp $\longrightarrow$ TT is followed by the decays T $\longrightarrow$ bW, T $\longrightarrow$ tH, and T $\longrightarrow$ tZ with equal branching fractions of 1/3. Events with one electron or muon, missing transverse momentum and jets are considered. For an integrated luminosity of 3000 fb−1, the search projects to exclude a T mass below 1750 GeV at the 95% confidence level. Conversely, a T quark with mass up to 1440 GeV can be discovered at the HL-LHC with a significance of five standard deviations.

Session

Top Quark and EW Physics

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