ID de Contribution: **2** Type: **Non spécifié**

Search for Vector-like T'(->tH) in hadronic final states using Neural Networks

mardi 25 avril 2023 10:30 (30 minutes)

The presence of Vector-Like Quarks (VLQ) is introduced as one of the candidates for extending physics beyond the standard model explaining the hierarchy problem. Search for VLQ will provide valuable input for evaluating many underlying models that explain the stabilization of the Higgs boson mass, offering a potential solution to the hierarchy problem, and so on. A dedicated analysis for the search of single produced VLQ, T'was performed with the data collected in 2016 and found an excess for T' Mass at 680 GeV over the background-only hypothesis in the full hadronic final state. In this study, we present the ongoing analysis on the search for single produced T'decaying into top and Higgs in the full hadronic final state increasing the sensitivity using neural network with the full Run2 data and potentially gaining significance by extending it into Run 3 analysis.

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