Contribution ID: **391** Type: **Talk**

Search for Vector-Like Quarks (T′⟶t(Wb)H(WW*)⟶t(lνb) H(4q))Decay with the CMS Detector at centre of mass energy 13 TeV.

Wednesday 14 December 2022 16:00 (15 minutes)

After a decade of Higgs boson discovery by the ATLAS and the CMS experiment at the LHC, subsequent observation of ttH events, and study of Higgs decaying into a pairs of W(Z) boson and τ fermion, physics beyond the standard model still remains a puzzle. Vector-like quarks (VLQs) are hypothetical spin-1/2 particles of the fourth generation that have left and right-handed components transforming exactly the same under $SU(3)_C \times SU(2)_L \times U(1)_Y$ group. They are key members in various BSM models, postulated to solve the hierarchy problem and stabilize the Higgs mass, while escaping constraints on the Higgs cross section measurement. This talk will present the current status of the search for VLQs (T′) decaying to a top quark($t \rightarrow Wb \rightarrow l\nu b$) and a Higgs boson($H \rightarrow WW^* \rightarrow 4q$) at the CMS experiment with a total integrated luminosity of 137fb^{-1} collected at the LHC. We will also discuss how jet substructure techniques can be used to identify the decays of the Higgs bosons, detailing the new Higgs⟶ $4q$ tagger based on Deep Neural Network.

Session

Beyond the Standard Model

Primary author: CHHETRI, Arjun (University of Delhi (IN))

Presenter: CHHETRI, Arjun (University of Delhi (IN))

Session Classification: WG2-Beyond the Standard Model