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Search for Vector-Like Quarks ($\mathbf{T'} \rightarrow \mathbf{t}(Wb)\mathbf{H}(WW^*) \rightarrow \mathbf{t}(l\nu b)\mathbf{H}(4q)$) Decay with the CMS Detector ARJUN CHHETRI, Univ of Delhi — The discovery of Higgs boson of mass 125 GeV in 2012 by the CMS and the ATLAS experiments at the LHC opens a whole new portal to physics beyond the Standard Model. Vector-like quarks (VLQs) are hypothetical spin-1/2 particles of the fourth generation that have left- and right-handed components transforming exactly same under $SU(3)_C \times SU(2)_L \times U(1)_Y$ group. They are 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 and a Higgs boson at the CMS experiment at the LHC. We will also discuss how jet substructure techniques can be used to identify the decays of top quarks and the Higgs bosons.

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