

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

A Search for Fully Hadronic Final State Vector-Like Quark Pair Production in 13 TeV pp Collisions Using CMS Data¹ RIKAB GAMBHIR, Rutgers University, New Brunswick, CMS COLLABORATION — We describe a search for the pair production of Bottom-type ($B\bar{B}$) Vector-Like Quarks (VLQ's) with masses greater than 1000 GeV in a fully hadronic final state in proton-proton collisions at a center-of-mass energy of 13 TeV recorded by the CMS Experiment. The analysis is based on a final state consisting of jets resulting from the b and \bar{b} quarks produced in the VLQ decays. Requiring that the jets are consistent with the production of a pair of bosons, each of which can be either a Higgs or a Z , that the reconstructed VLQ's have equal masses, and that several of the jets are tagged as originating from the b and \bar{b} quarks greatly reduces the Standard Model background. We use a χ^2 metric based on the masses of the bosons and the equality of the two VLQ masses to reconstruct the event. Since for a highly boosted Higgs or Z the two jets resulting from the daughter quarks might be merged, we carry out independent analyses depending on the number of observed jets. We present expected exclusion limits as a function of the $B \rightarrow bH$ and $B \rightarrow bZ$ branching fractions using 137 fb⁻¹ of integrated luminosity collected by CMS during the 2016, 2017, and 2018 run periods.

¹This work is supported by the National Science Foundation award PHY-1913356.

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Date submitted: 10 Jan 2020

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