

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

A Combined Search for Pair-Produced Vector-Like Quarks in 13 TeV pp Collisions Using CMS Data¹ NOAH PALADINO, Rutgers University, New Brunswick, CMS COLLABORATION — We describe a combination analysis of a fully hadronic and a di-leptonic search for the pair production of Bottom-type ($B\bar{B}$) Vector-Like Quarks (VLQs) with masses greater than 1000 GeV in proton-proton collisions at a center-of-mass energy of 13 TeV recorded by the CMS Experiment. In both searches, we detect events in which each VLQ decays to a b quark and either a Higgs or a Z boson. The fully hadronic search is based on events in which the Higgs and Z bosons decay into quark anti-quark pairs while the di-leptonic search is based on events in which one or more Z bosons decay to a lepton anti-lepton pair. In both cases, a χ^2 metric based on the masses of the bosons and the equality of the two VLQ masses is used to reconstruct the event. We combine the results from the two analyses while ensuring that the two analyses are fully independent. We present the expected exclusion limits for the combination of the two analyses as a function of the $B \rightarrow bH$ and $B \rightarrow bZ$ branching fractions. The data analyzed corresponds to 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.

Stephen Schnetzer
Rutgers University, New Brunswick

Date submitted: 10 Jan 2020

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