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# Search for the pair production of vector-like quarks in the Wq+X fianl state with the full Run 2 ATLAS dataset

*Saturday, 9 April 2022 11:40 (20 minutes)*

Vector-like quarks (VLQ) are predicted in many extensions to the Standard Model (SM) as their vector-like nature allows them to extend the SM while still being compatible with electroweak sector measurements. Pair production of VLQ provides a model-independent method of searching due to the QCD production of the particles. While most searches have focused on VLQs that decay to an SM boson and a third-generation quark, decays to light quarks have been largely overlooked. This talk presents the expected results of a search for pair production of vector-like down quarks that decay into a leptonically decaying SM W boson and a light quark, with the other VLQ decaying to a hadronically decay boson and a light quark. The analysis uses boosted boson identification and data-driven correction of the dominant W+jets background prediction to improve sensitivity. Further, this analysis extends the sensitivity of previous analysis done in Run 1 by increasing the collision energy and the statistics by including the full Run 2 ATLAS dataset with an integrated luminosity of 139 $fb^{-1}$.

## Career stage

Graduate student

**Author:** VAN DE WALL, Evan Richard (Oklahoma State University (US))

**Presenter:** VAN DE WALL, Evan Richard (Oklahoma State University (US))

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