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Seach for vector-like quarks in single-lepton events with DNN techniques[1] EVAN SCHARNICK, CODY HOLZ, SAM JOHNSON, JULIE HOGAN, Bethel Univ, CMS COLLABORATION — We will present an on-going search for vector-like quarks using proton collision data collected by the Compact Muon Solenoid Experiment (CMS) during Run 2. We focus on the vector-like quarks that are analogous to top and bottom quarks. This search includes events with one electron or muon, and several large-radius jets. We identify the source particles of these jets with a new deep neural network technique called DeepAK8. In addition, we expanded the effectiveness of our own deep neural network for distinguishing between signal events with vector-like quarks and two types of background events with top quarks or W bosons. These new techniques, in addition to the full Run 2 dataset from CMS, dramatically increase our sensitivity to high-mass vector-like quarks.

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