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## Updating LHC Constraints on the 2HDM with Vector-Like Quarks: T Singlet and T Doublet Scenarios

We present a recomputation of the Large Hadron Collider (LHC) bounds for the Two-Higgs-Doublet Model (2HDM) extended with vector-like quarks (VLQs), building upon the reported limits for the Standard Model (SM) augmented with VLQs. Our analysis focuses on two distinct scenarios: the vector-like T singlet and the vector-like T doublet. By re-evaluating the experimental constraints and incorporating the additional scalar interactions from the 2HDM, we derive updated exclusion limits and sensitivity projections for the parameter space of both VLQ representations. These results provide new insights into the interplay between the 2HDM and VLQ sectors, offering refined guidance for future LHC searches and phenomenological studies.

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