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## Search strategies for composite top partners at LHC run II

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**Abstract:** We discuss several new search strategies for heavy vector-like quark partners at the early stages of the LHC run-II. Run-II will have sensitivity to single- and pair-produced quark partners with masses beyond 1 TeV. Decays of such heavy particles yield highly boosted tops, Higgses, and weak gauge bosons, all of which decay dominantly hadronically. At low boost, hadronic final states suffer from large Standard Model backgrounds, such that leptonic or semi-leptonic decay channels yielded better discovery potential at run-I. At high boost, the SM background of hadronic final states can be substantially suppressed when applying jet-substructure techniques. We present several case studies where the identification of hadronically decaying tops, Higgses, and/or electroweak gauge bosons allow to make new search channels competitive at run-II.

based on: arXiv:1507.06568 (and earlier works: 1409.0409, 1410.8131, 1501.07456)

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