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Search for electroweak production of a vectorlike quark decaying to a top quark and a Higgs or Z boson using boosted topologies in an all-hadronic final state

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We present a search for the electroweak production of a vector-like top quark partner T of charge $+2/3$ in association with a standard model top or bottom quark, using proton-proton collision data at $\sqrt{s}=13$ TeV collected by the CMS Experiment at the CERN LHC. Our search targets T quarks decaying to a top quark and a Higgs or Z boson in a fully hadronic final state. For a T quark with mass above 1 TeV the daughter top quark and Higgs/Z boson are highly Lorentz-boosted and can appear together as a single hadronic jet. The top quark and Higgs/Z boson are identified using b-tagging and jet substructure techniques, which also acts to suppress the standard model backgrounds.

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