

Abstract Submitted  
for the APR14 Meeting of  
The American Physical Society

**Reconstructing the vector-like top partner from fully hadronic events**<sup>1</sup> MARTIN STOLL, MOTOI ENDO, KOICHI HAMAGUCHI, KAZUYA ISHIKAWA, The University of Tokyo — Vector-like top partners are predicted by Little Higgs models, appear in loops in extensions to supersymmetric models or are part of effective BSM models. After mixing with third generation quarks, decay channels are  $t' \rightarrow th$ ,  $t' \rightarrow tZ$  and  $t' \rightarrow bW^+$ . Vector-like tops have been subject to recent searches at the LHC where final-state leptons were used to suppress the large QCD backgrounds and exclusion bounds are  $m_{t'} > 700\text{--}800$  GeV. We propose a new method to kinematically reconstruct vector-like tops from fully hadronic final states at the LHC Run II. We expect more signal events because the branching ratio  $t \rightarrow$  hadrons is large. However efficient rejection of the overwhelmingly large backgrounds is crucial. Jet unclustering / substructure methods prove useful here and we employ them (HEPTopTagger and BDRS Higgs tagger) to reconstruct boosted  $t$  and  $h$  from the heavy  $t'$  decay. We investigate different parameters for the mass and branching ratios of  $t'$ . A good signal-to-background ratio is found and it is shown that kinematic reconstruction of the top partner and even a mass measurement are possible.

<sup>1</sup>This work was supported by the Program for Leading Graduate Schools, MEXT, Japan.

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Date submitted: 06 Feb 2014

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