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Searches for new physics with third generation quarks using the ATLAS detector at the LHC

The presence of fermionic top/bottom quark partners, referred to as vector-like quarks (VLQs), may be an important ingredient for mechanism to cancel mass divergence for the Higgs boson required for “natural” theories beyond the Standard Model (SM). The VLQs typically couple preferentially to the third generation SM quarks. In addition, there are many extensions of the SM that predict new particles decaying into a pair of top-quarks, such as Kaluza-Klein excitation of the gluon in a Randall-Sundrum model of extra dimensions. This talk highlights recent ATLAS results for new physics involving third generation quarks at LHC Run 2.

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