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## Photon initiated single top quark production via flavor-changing neutral currents at the LHC

Single top quark production has been employed as a powerful and sensitive process to search for new physics signs by many experiments. In this work we propose and investigate a search for top quark flavor changing neutral currents (FCNC) via photon through the single top quark production in proton-proton collisions. We show that the direct single top quark final state can provide constraints on the strength of top-quark-gamma and top-quark-gluon FCNC interactions simultaneously. The results of a search for the direct top quark production at the LHC at a center-of-mass energy of 8 TeV performed by ATLAS collaboration are used to set first experimental limits on the anomalous top-quark-gamma FCNC couplings through direct top quark production.

### Summary

In this study the potential of the direct top production for probing anomalous  $tq\gamma$  interaction in proton-proton collisions is investigated. In addition, experimental results are used to prove the sensitivity of the proposed channel and tight constraint are set on the strength of the  $tq\gamma$  anomalous couplings.

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