

# Phenomenology 2021 Symposium



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## The search for rare top production and decay processes with the ATLAS experiment at the LHC

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Run 2 of the LHC has witnessed the observation of rare top quark production processes predicted by the Standard Model and has enabled searches for heavily suppressed flavour-changing-neutral-current interactions of the top quark. In this contribution the highlights are shown of searches by the ATLAS experiment for rare processes involving top quark. The associated top quark production processes of a top quark pair with Standard Model gauge bosons have been observed, as well as the  $tZq$  process, and provide tight constraints on the top quark electro-weak couplings. Recently, the ATLAS experiment has announced evidence for the four-top-production process, and has performed a combined measurement of the  $t\bar{t}t\bar{t}$  cross section in the single-lepton, two-lepton and multi-lepton channels. Finally, results are presented of searches for flavour-changing-neutral-current processes involving top quarks.

### Summary

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