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Title: Top quark physics with the ATLAS experiment at the LHC

The large top quark samples in top quark pair and single top production have yielded measurements of the production cross section of unprecedented precision and in new kinematic regimes. They have also enabled new measurements of top quark properties that were previously inaccessible, enabled the observation of many rare top quark production processes predicted by the Standard Model and boosted searches for flavour-changing-neutral-current interactions of the top quark, that are heavily suppressed in the SM. In this contribution the highlights of the ATLAS top quark physics program are presented. ATLAS presents in particular new measurements of the production cross section and production asymmetry of highly boosted top quark pairs and of the top quark polarization in t-channel single top production. The recent observation of associated production of a single top quark with a photon completes the list of processes and adds sensitivity to the EW couplings of the top quark. ATLAS furthermore reports strong evidence for the four-top-production process. Strict bounds are also presented of searches for flavour-changing-neutral-current processes involving top quarks.