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Measurement of top quark properties using the ATLAS detector at the LHC

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Result of merged abstracts:

In proton-proton collisions at the LHC, pairs of top and anti-top quarks are expected to be mostly produced through gluon fusion. Making use of the large number of top quark pairs collected in the 7 TeV data, we present measurements of the spin correlation between top and anti-top quarks using several variables and discuss their sensitivity to new physics. In addition, we present measurements of the top quark polarisation predicted in models with CP-conserving and CP-violating processes. A top pair-enriched sample of events with a single lepton (electron or muon), missing transverse momentum and at least four high transverse momentum jets, of which at least one is tagged as coming from a b-quark, is used to measure tt production charge asymmetry to $A_c=0.006 \pm 0.010$. Differential A_c measurements as a function of the invariant mass, the rapidity and the transverse momentum of the tt-system are also presented. In addition, A_c is measured for a subset of events with large tt velocity, where physics beyond the Standard Model could contribute. All measurements are consistent with the Standard Model predictions.

Properties of the top quark are measured in proton-proton collisions data at 7 and 8 TeV. The charge of the top quark of the top quark is found in agreement with the Standard Model prediction. In addition, the polarization of W bosons is measured. Together with other measurements this probe the structure of the Wtb-vertex are measured and constraints on anomalous couplings derived. A search for flavour changing neutral current processes in top quark decays is also presented.

Summary

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