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## Top quark pair properties - spin correlations, top quark pair asymmetry and complex final states using the ATLAS detector at the LHC

The top quark pair charge asymmetry is an asymmetry predicted to occur beyond leading-order QCD in the Standard Model, and may be significantly enhanced by the presence of new physics. The  $t\bar{t}$  production charge asymmetry is measured inclusively and differentially using the 7 and 8 TeV ATLAS datasets. Making use of the large number of top quark pairs collected, we also present measurements of the spin correlation between top and anti-top quarks using several variables and discuss their sensitivity to new physics. A search for flavour changing neutral current processes in top quark decays is also presented.

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