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Measurement of colour flow using jet-pull observables in top-quark-antiquark events with the ATLAS experiment at $\sqrt{s} = 13$ TeV

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Measurements of distributions of two weighted angular moments derived from jet constituents are presented. The jet-pull angle and the jet-pull magnitude, both of which are derived from the jet-pull angular moment, encode the colour connections between partons that seed the jets.

The measurements are performed in top-quark-antiquark events with one leptonically decaying W boson and one hadronically decaying W boson, using 36.1 fb⁻¹ of pp collision data recorded by the ATLAS detector at a centre-of-mass energy of 13 TeV delivered by the Large Hadron Collider. The observables are measured for two dijet systems, corresponding to the colour-connected daughters of the W boson and the two b-jets from the top-quark decays. To allow the comparison of the measured distributions to colour model predictions, the measured distributions are unfolded to particle level, after correcting for experimental effects introduced by the detector. While good agreement can be found for some combinations of predictions and observables, none of the predictions describes the data well across all observables.

Reference: TOPQ-2017-13,

<https://atlas.web.cern.ch/Atlas/GROUPS/PHYSICS/PAPERS/TOPQ-2017-13/>

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