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Measurement of the inclusive jet & dijet production, k-t splitting in Z with the ATLAS detector

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The production of inclusive jets and di-jets at hadron colliders provides a stringent test of perturbative QCD at the highest energies. The process can also be used to probe the gluon density function of the proton.

The ATLAS collaboration has measured the inclusive jet production cross section in 20.3 /fb of data collected at a center-of-mass energy of 8TeV and in 3.2 /fb of data collected at a center-of-mass energy of 13TeV. The measurements have been performed differentially in jet rapidity and transverse momentum. The collaboration also presents a first measurement of the di-jet cross section at a center-of-mass energy of 13TeV as a function of the di-jet mass and rapidity. The results have been compared with state-of-the-art theory predictions at NLO in pQCD, interfaced with different parton distribution functions.

While properties of the jets are typically directly using the jet momenta, we present here a complementary approach, studying the jet production rates at different resolution scales. In particular, we present a measurement of the splitting scales occurring in the kt jet-clustering algorithm for final states containing a Z-boson candidate at a centre-of-mass energy of 8 TeV. The measurement is based on charged-particle track information, which is known with excellent precision in the pT-region relevant for the transition between the perturbative and the non-perturbative regimes. The data are corrected for detector effects and are compared to state-of-the-art Monte Carlo predictions.

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