

# In-Situ combination of jet uncertainties and the production of jet calibrations for the ATLAS detector

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Collimated beams of particles called ‘jets’ are a common product of proton-proton collisions at the Large Hadron Collider (LHC), located in CERN, Geneva. These jets are crucial for many standard model and beyond the standard model analyses performed with the ATLAS detector and as such, having the correct calibration and uncertainties for these objects is incredibly important. A large component of these calibrations are systematic uncertainties derived from in-situ measurements of the differences in detector response between data and simulated (MC) samples.

The statistical combination of various in-situ measurements to produce a combined systematic will be presented here. In addition, the collection of this and other uncertainties into calibrations which can be used by the ATLAS collaboration to account for jet energy scale (JES), jet energy resolution (JER), and jet mass scale (JMS) calibrations will also be discussed. The result of the work presented is a set of calibrations for multiple jet types and Monte Carlo simulated data generators which are currently in use by members of the ATLAS collaboration to conduct their various analyses.

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