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Determination of the Jet Energy Scale and the Jet Energy Resolution in the 20fb-1 of data collected by the ATLAS detector in 2012

Precision measurements of jets produced in pp collisions at the LHC are of key importance to analyses measuring Standard Model processes or searching for new physics. To account for signal losses in the detector, the energy of calorimeter jets needs to be calibrated. In ATLAS, jets are calibrated in multiple steps using techniques driven by both Monte Carlo simulations and data. The jet energy scale (JES) is evaluated and corrected after pile-up removal using QCD dijet Monte Carlo simulation. Further Monte Carlo based corrections take advantage of the dependence of the JES on tracker and calorimeter observables. The final correction and the total JES uncertainty are determined using in-situ techniques which compare the jet energy to the energy of a calibrated reference object. The jet energy resolution (JER) is evaluated in Monte Carlo simulation by comparing the reconstructed jet energy to the energy of jets constructed from stable simulated particles. The JER and its total uncertainty are also measured in data using in-situ techniques similar to those used to determine the jet energy scale. A summary of the techniques used by ATLAS to assess the jet energy scale and jet energy resolution are presented here.

Summary

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