

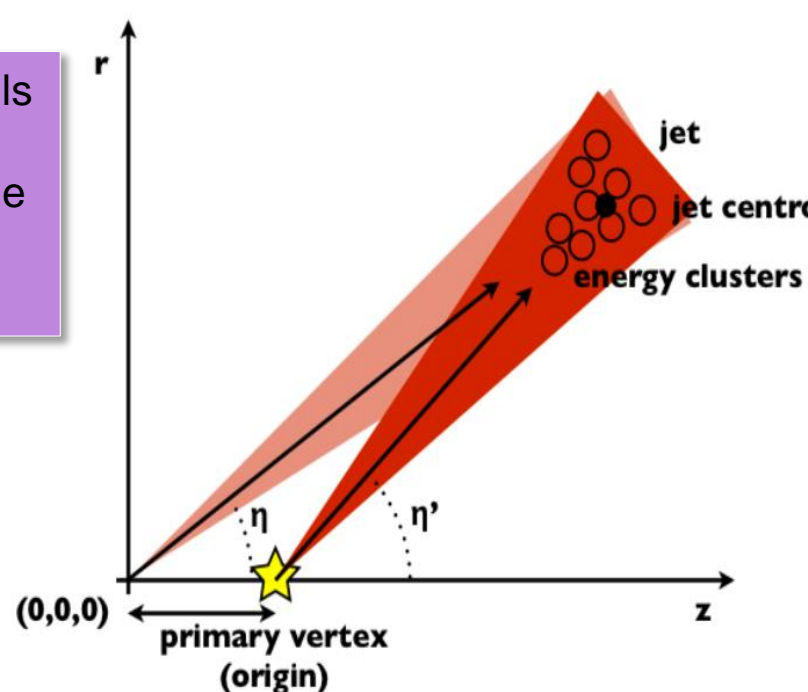
JET ENERGY SCALE CALIBRATION AND UNCERTAINTIES

A jet is a collection of objects produced by the hadronization of a parton (quark or gluon). They are constructed from topological clusters in the detector in order to re-create the initial parton from the collision. The set of corrections applied to the jets constitutes the Jet Energy Scale (JES). These corrections are based on simulation and data. This poster describes the steps of the JES and the uncertainties on the JES and JER.

Jets - EM scale

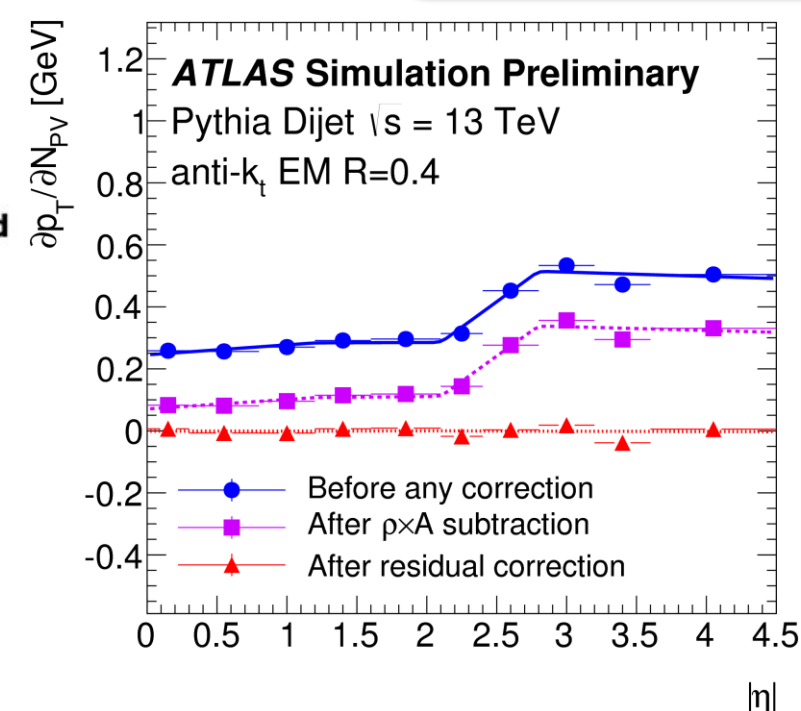
- Energy is deposited on the calorimeter cells
- Topo-clusters are derived from the cells
- Clusters are calibrated at EM or LCW scale
- The jet is a collection of clusters in a cone
- Additional corrections are applied (JES)

Changes the jet direction from the origin to the primary vertex.
Does not affect the energy.



Origin correction

Pile up correction



Jet areas correction:
estimates the pileup density and corrects the jet according to its area

Residual correction:
removes npv and <mu> dependences

Absolute EtaJES

GSC

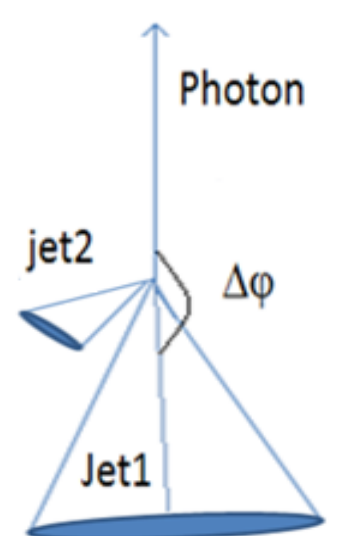
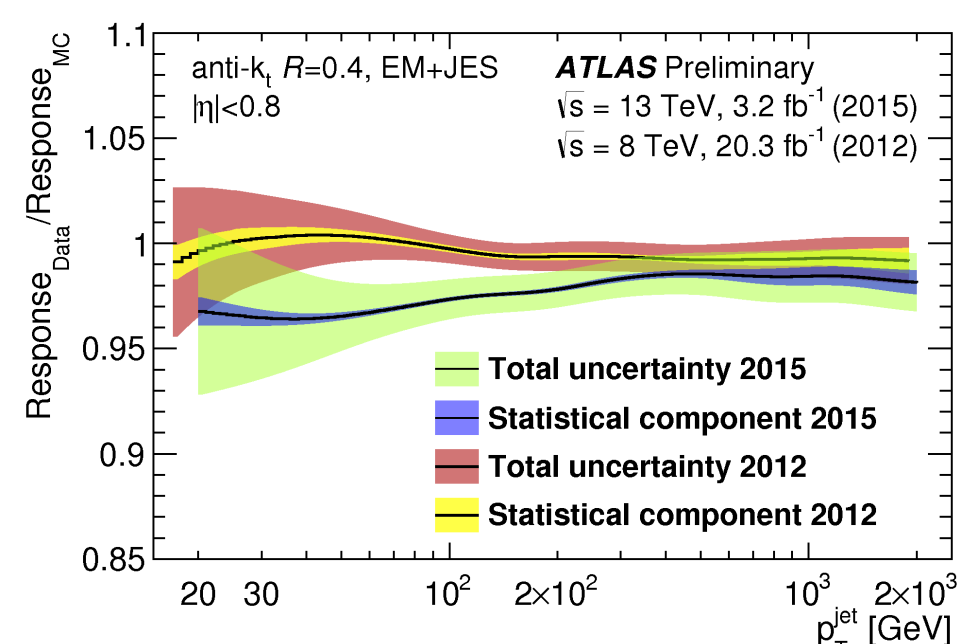
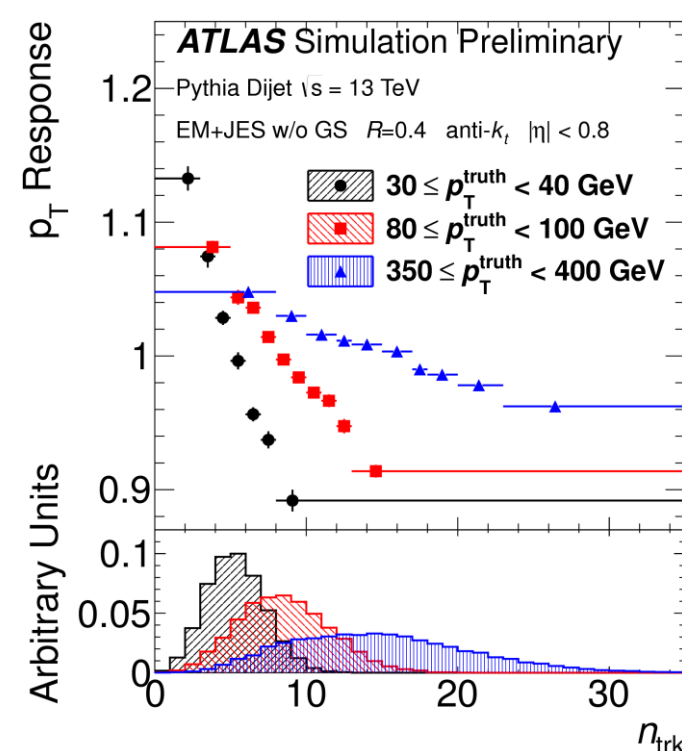
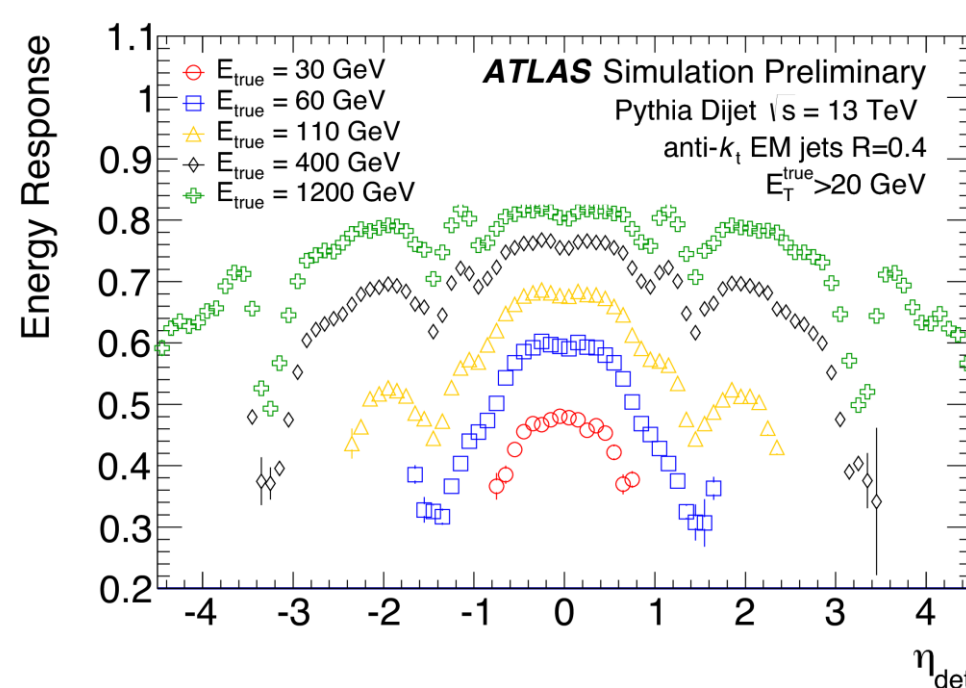
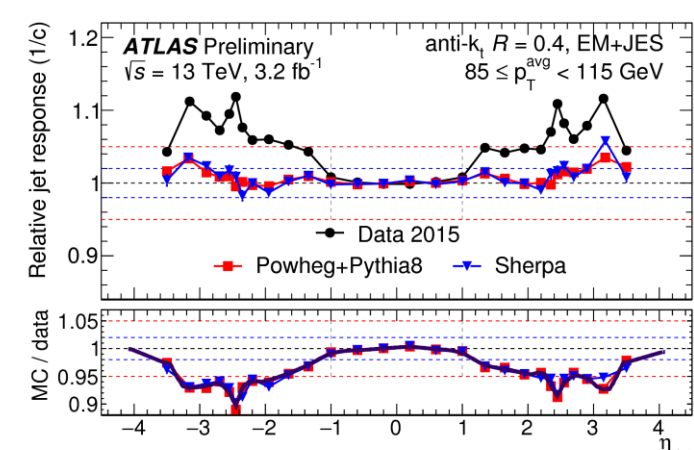
In-situ correction

- Energy correction using truth jets from simulation
- Eta correction from the detector effects

Global Sequential Calibration is a set of corrections that reduce the JES dependence from the initial parton

Calibrates the jet pt using the data. Last part of the JES.
Relative calibration (eta inter calibration)

- Dijet events
- **Absolute calibration**
- Z/Gamma + jet events
- Multi jet events



JES Uncertainties

JER Uncertainties

The **Jet Energy Resolution** is defined as the standard deviation of the Gaussian fit to the jet response distribution

