JME

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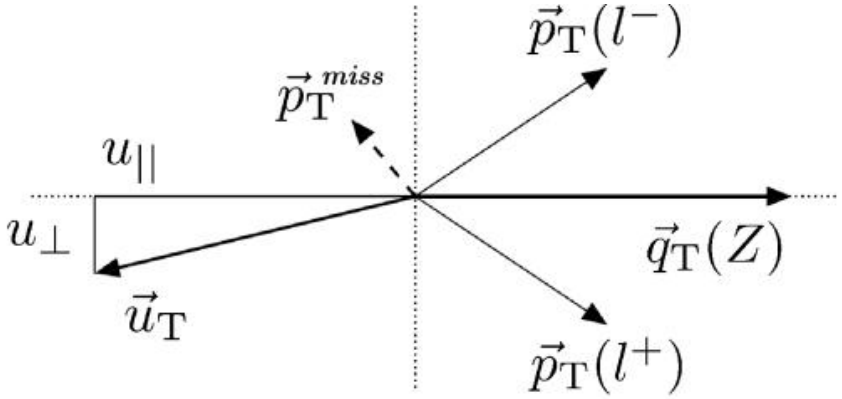
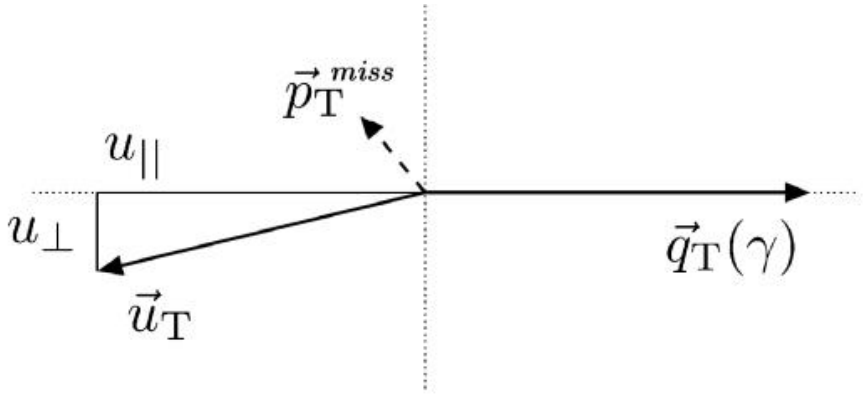
Performance of the PT^{miss} algorithm

- The response and resolution of PT^{miss} is studied in samples with an identified Z boson decaying to a pair of electrons or muons, or with an isolated photon.

- Such events should have little or no genuine PT^{miss}, and the performance is measured by comparing the momenta of the vector boson to that of the hadronic recoil system.

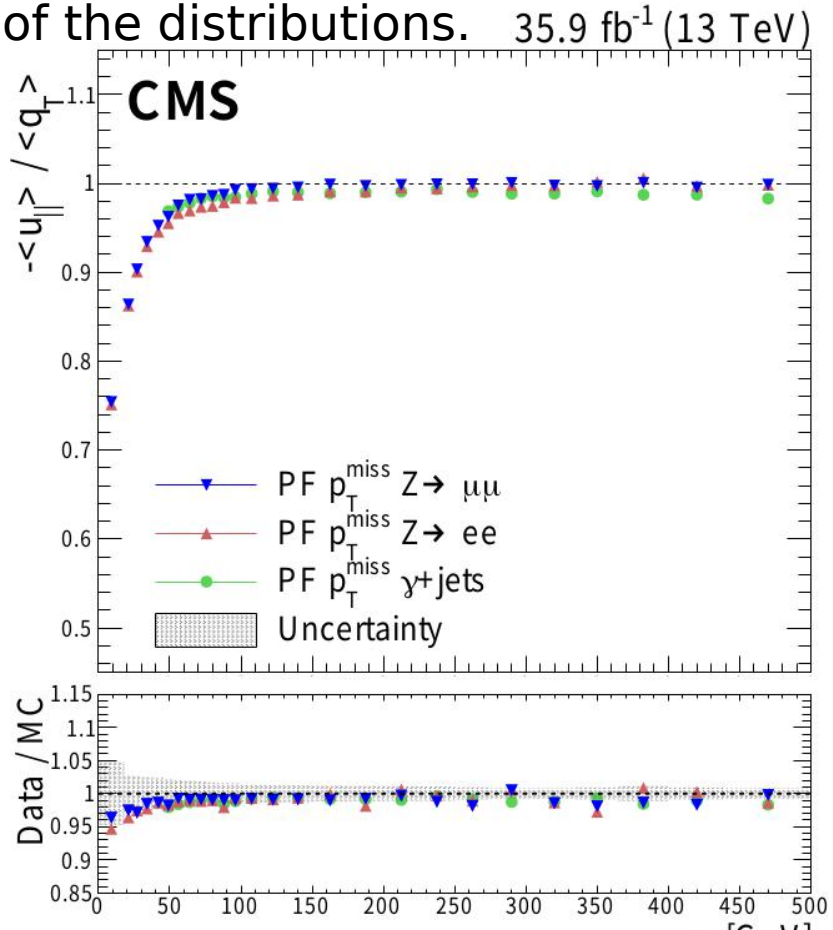




Z boson (left) and photon (right) event kinematics in the transverse plane. The vector UT denotes the vectorial sum of all particles reconstructed in the event except for the two leptons from the Z decay (left) or the photon (right).

Performance of the PT^{miss} algorithm

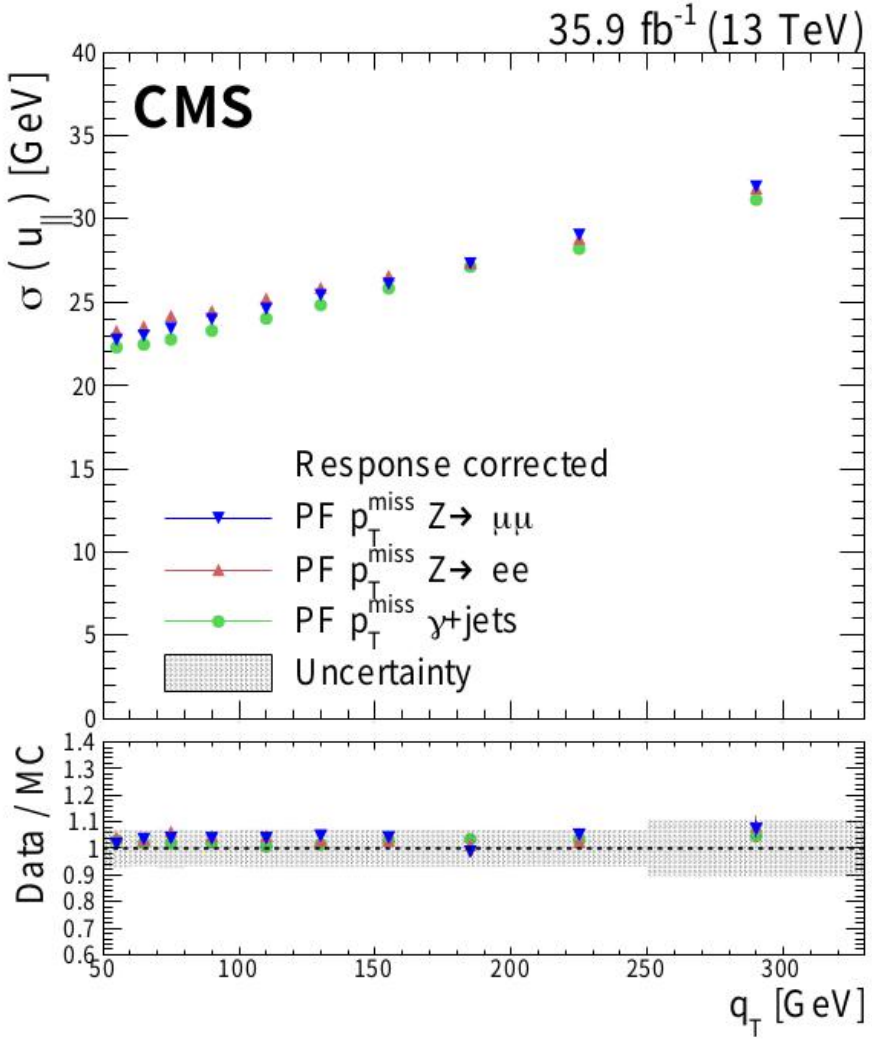
The response of p miss is defined as $<U_{||}>/<q_T>$ where < > indicates the mean of the distributions.

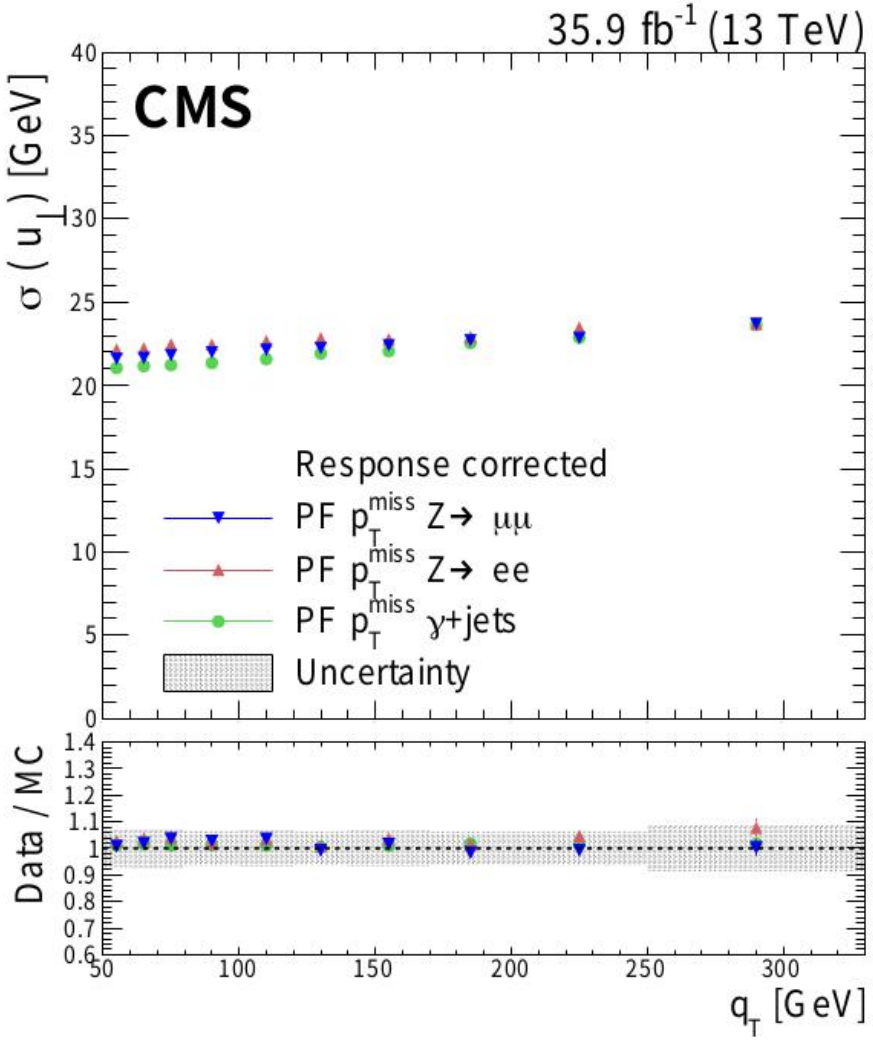


PT^{miss} response as a function of q_T , in data and simulation, in Z → μ μ ,Z → e e , and photon events. The response reaches unity for boson p T > 100 GeV. Deviations from unity indicate imperfect calibration of the hadronic energy scale.

Performance of the PT^{miss} algorithm

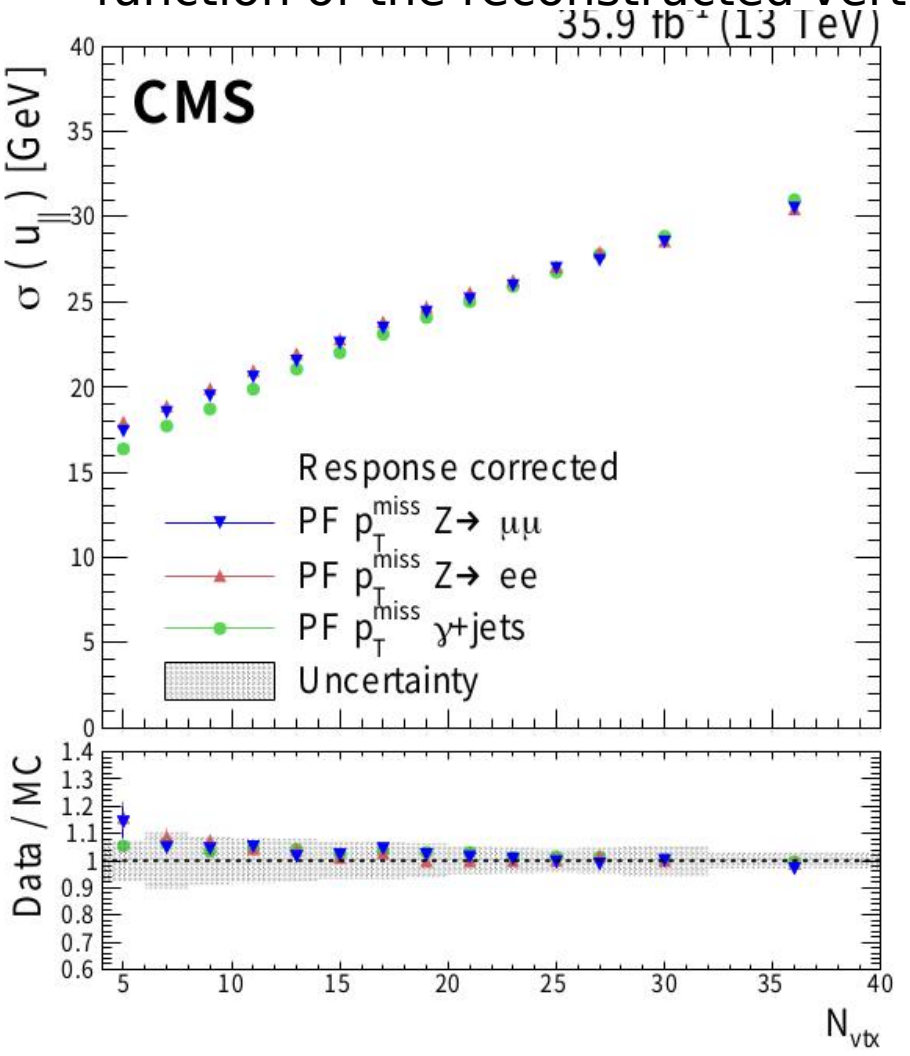
resolution of the $u_{||}$ and $u_{\perp}$ components of the hadronic recoil as a function of q_T

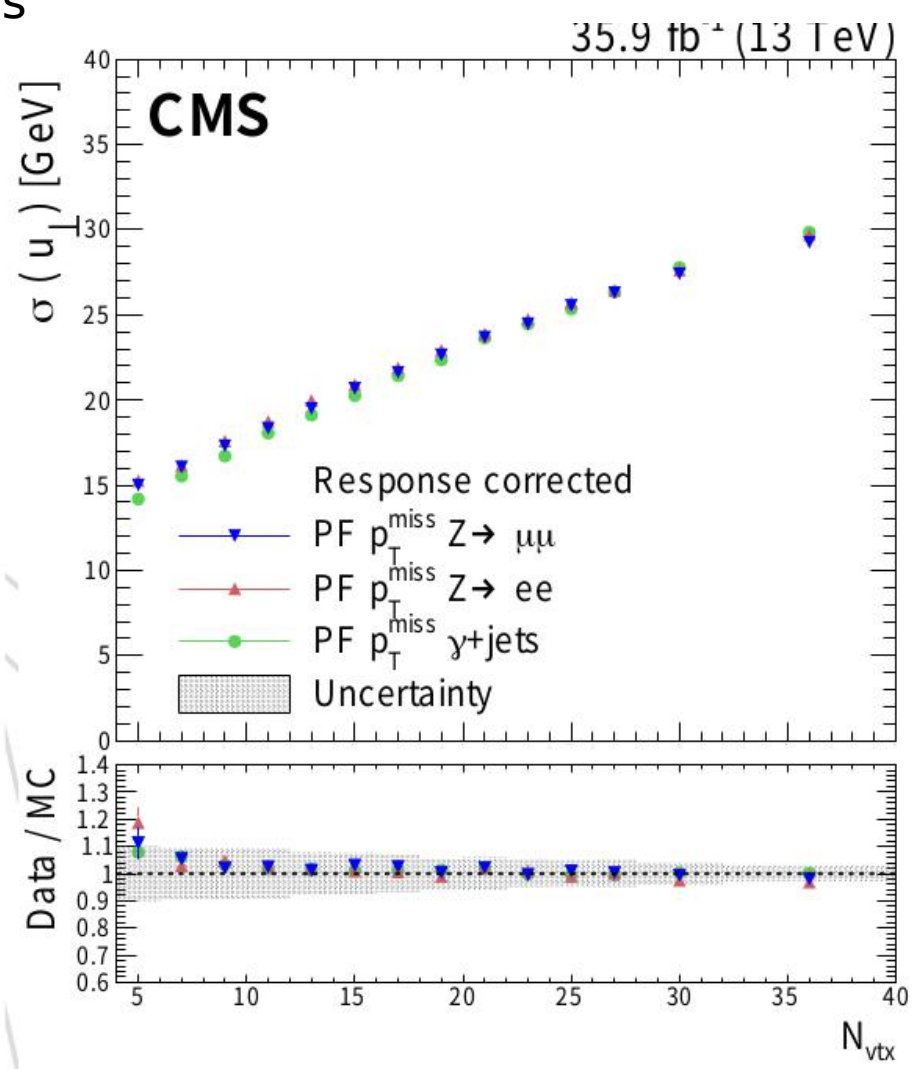




Performance of the PT^{miss} algorithm

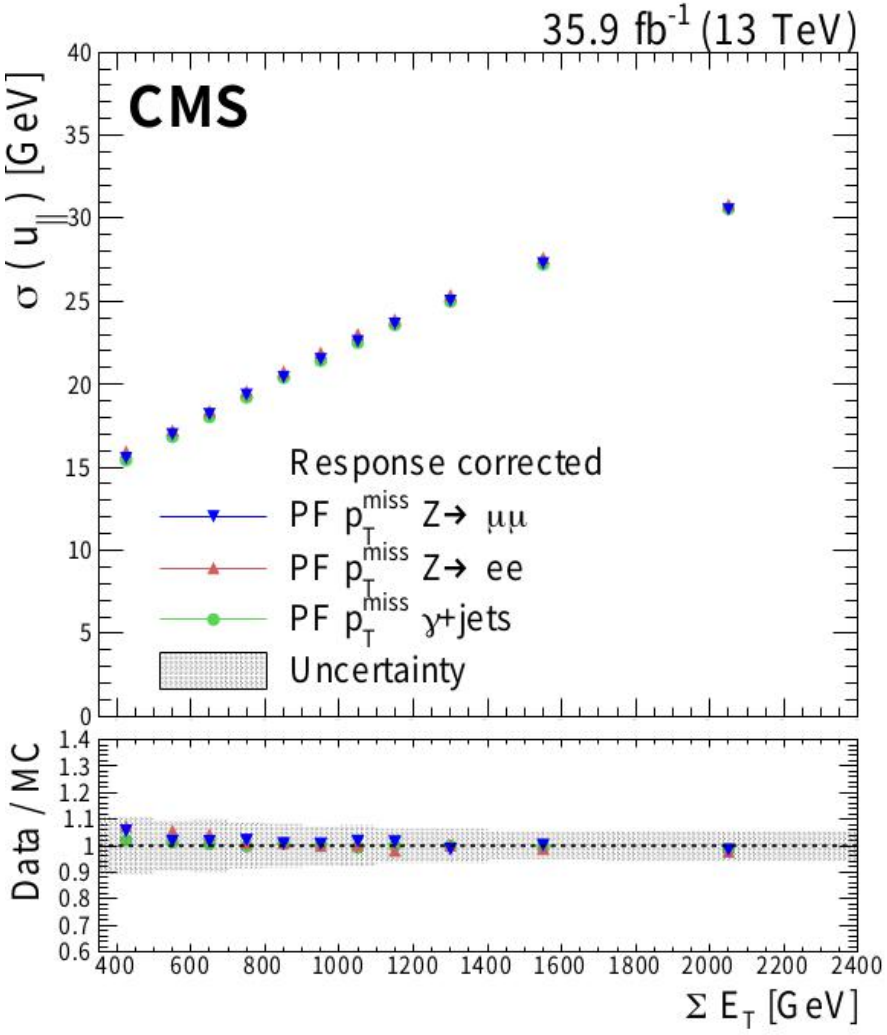
resolution of the $u_{||}$ and $u_{\perp}$ components of the hadronic recoil as a function of the reconstructed vertices

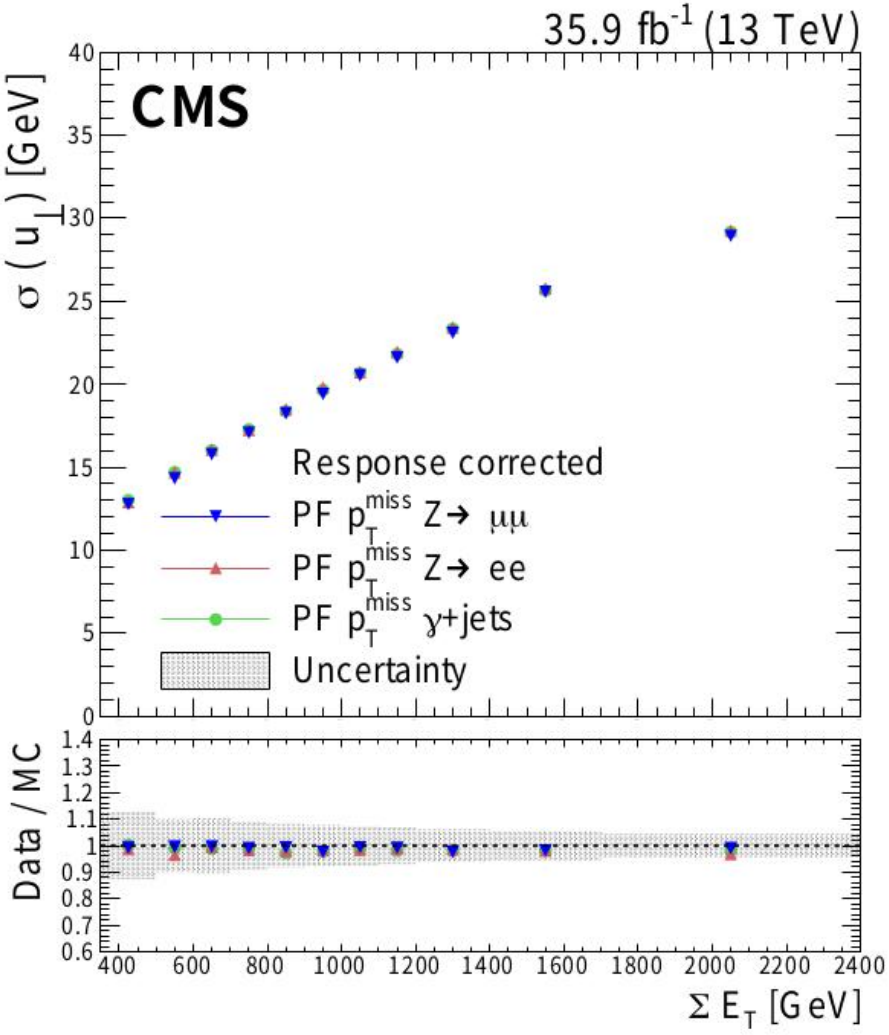




Performance of the PT^{miss} algorithm

resolution of the $u_{||}$ and $u_{\perp}$ components of the hadronic recoil as a function of the scalar P_T sum of all PF candidates

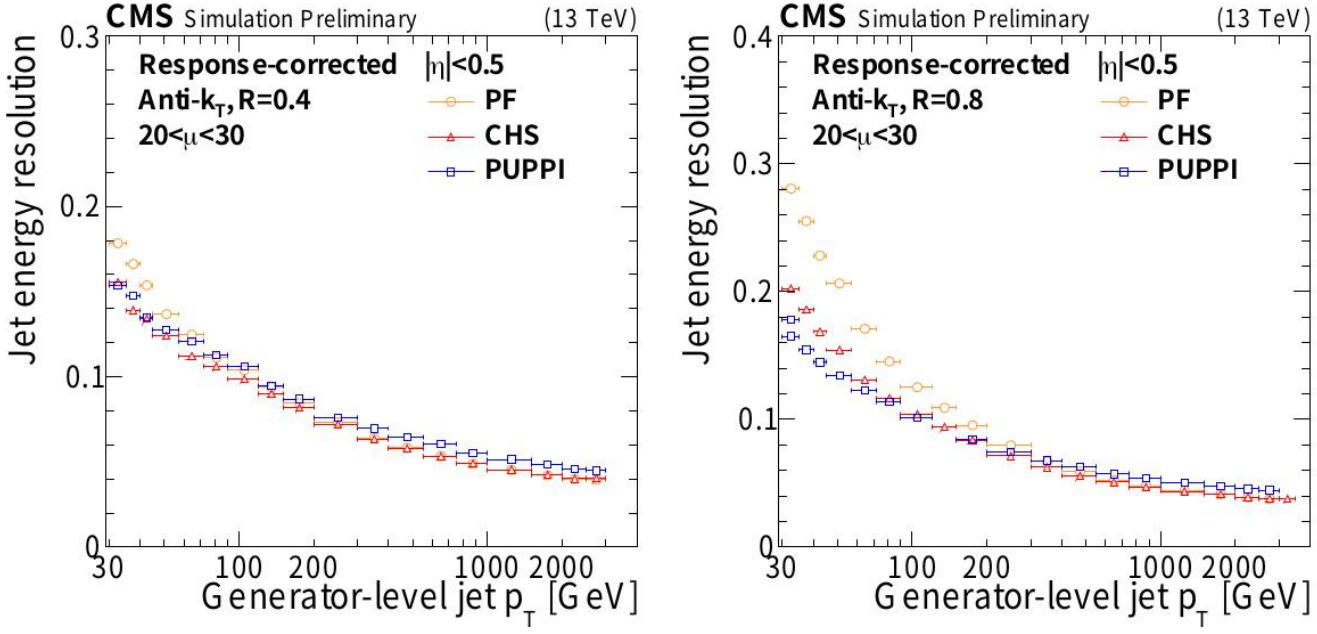




Jet reconstruction

check Jet energy and angular resolution, the performance of the jet four-momentum reconstruction is evaluated in QCD

The jet energy resolution (JER) is defined as the spread of the ratio of reconstruction and generator-level jet p_T (the response).The response distribution is to a very good approximation Gaussian. The resolution is defined as the σ.



JER as a function of the jet P_T for jets reconstructed from all of the PF candidates (PF jets), CHS jets, and PUPPI jets,simulated with on average 20–30 true PU interactions.

Jet reconstruction

Jet energy resolution as a function of the number of pileup interactions for jets with CHS and with PUPPIapplied in QCD multijet simulation for different jet P_T values.