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Performance of Jet and Missing Transverse Energy Reconstruction with CMS in pp Collisions at $\sqrt{s} = 7$ TeV

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Data from pp collisions have been used to study jets and missing transverse energy (MET) in the CMS experiment at the Large Hadron Collider. Results are presented for four different approaches to reconstruct jets and three different approaches to reconstruct MET in The CMS detector: calorimeter-only based jet and MET reconstruction; an algorithm which improves the measurement of calorimeter jets and MET by exploiting the associated tracks; the “Particle Flow” method, which reconstructs each particle in the event based on information from all sub-detectors, prior to the clustering of jets or the calculation of MET; and jets reconstructed from tracks only. The results are compared to those from fully simulated Pythia events. For MET the performance is studied using inclusive pp interactions and also exclusive states such as events containing two high transverse momentum jets, W bosons, Z bosons or isolated, high transverse momentum photons in 7-TeV proton-proton collisions. For jets, pT balance in dijet and photon+jet events is used to measure the jet response as function of pseudorapidity, absolute jet response in the central pseudorapidity region, and jet resolution in multiple regions. Further, we present measurements of the offset energy from noise and pile-up in a jet.

Primary author: CMS COLLABORATION**Presenter:** WENG, Joanna (CERN)**Session Classification:** 01 - Early Experience and Results from LHC**Track Classification:** 01 - Early Experience and Results from LHC