

ParticleNet: Calibration of the jet energy scale using pT regression with partial Run3 data collected by the CMS experiment

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We are presenting the first calibration of the jet pT regression (CMS-DP-2024-064), achieving an expected improvement in jet resolution of up to 17%, and the latest performance results for flavor identification and jet energy resolution estimation using ParticleNet. The pT regression, which focuses on correcting the reconstructed jet pT to the truth-level jet pT, is divided into two components: the visible part due to detector and jet misreconstructions and the invisible part including the regression of the neutrinos which are not reconstructed by the detector. A key focus is represented by the jet energy scale calibration for the regressed pT, based on data from proton-proton collisions at $\sqrt{s} = 13.6$ TeV in 2022 and 2023. The results are shown for jets clustered from particle flow candidates using the anti-kT algorithm with radius parameter 0.4, and applying the Pileup Per Particle Identification algorithm for pileup mitigation. Our findings demonstrate that the standard jet correction chain can be successfully applied to the regressed pT.

Track

Uncertainties

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