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Studies of QCD jet production with the CMS detector in pp Collisions at sqrt(s) = 7 TeV

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We report on an extensive list of analyses in order to test QCD predictions for jet production in pp collisions at sqrt(s)=7 TeV, recorded by the CMS experiment. The list includes a measurement of the inclusive jet spectra, obtained with different jet reconstruction methods, the ratio of the inclusive three-jet over two-jet cross sections as a function of the total jet transverse momentum HT, hadronic event shapes as determined from jet momenta, azimuthal decorrelations between the two leading jets, dijet invariant mass spectra and the production ratio for events with two leading jets in two regions of pseudorapidity. Finally, we also present a study of the jet transverse structure, the charged hadrons multiplicity in jets and the longitudinal and transverse momentum distribution of charged hadrons relative to the jet axis. Many of these analyses are based on ratio quantities, where important experimental systematic uncertainties and most notably the luminosity uncertainty cancel.

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