

Jet performance and pileup mitigation in CMS

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Every bunch crossing at the LHC causes not just one proton-proton interaction, but several. These additional collisions are called “pileup”. With the increasing luminosity of the LHC also the number of pileup interactions per bunch crossing increased in the past years and it will reach up to 140 during high-luminosity LHC operation. Removing the pileup from an event is essential, because it does not only affect the jet energy but also other event observables as for example the missing transverse energy, the jet substructure, jet counting and the lepton isolation. In addition, jets as an experimental signature of energetic quarks and gluons produced in high energy processes, need to be calibrated in order to have the correct energy scale. A detailed understanding of both the energy scale and the transverse momentum resolution of jets at the CMS is of crucial importance for many physics analyses. In this talk we present recent developments in terms of jet energy scale and resolution, substructure techniques and pileup mitigation techniques.

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