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Performance of pile-up mitigation techniques for jets in pp collisions with the ATLAS detector

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The large rate of multiple simultaneous proton-proton interactions, or pile-up, generated by the Large Hadron Collider in Run I required the development of many new techniques to mitigate the adverse effects of these conditions. This presentation shows the methods employed to correct for the impact of pile-up on jet energy, jet shapes, and even spurious additional jets. Energy correction techniques that incorporate sophisticated estimates of the average pile-up energy density and tracking information are described in detail. Jet-to-vertex association techniques are also presented. We also describe the extension of these techniques to ameliorate the effect of pile-up on jet shapes using both subtraction and grooming procedures. Prospects for pile-up suppression at the HL-LHC will be also discussed.

Collaboration

ATLAS collaboration

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