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Measurements of jet substructure at ATLAS

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Theoretical calculations for jet substructure observables with accuracy beyond leading-logarithm have recently become available. Such observables are significant not only for probing a new regime of QCD at a hadron collider, but also for improving the understanding of jet substructure properties that are used in many searches for physics beyond the Standard Model. In this talk, we present precision measurements that probe the internal structure of jets using data collected by the ATLAS experiment at $\sqrt{s} = 13$ TeV. The soft drop mass is measured in dijet events. We also present a measurement of substructure variables in $t\bar{t}$ and inclusive jet events. If available, a measurement of jet substructure observables performed using charged particles is also presented. Each of these measurements are performed with large-radius jets. We also present two measurements that probe jet fragmentation and $g \rightarrow b\bar{b}$ splitting. All of the measurements are corrected for detector effects, represented as particle-level distributions and are compared to the predictions of various Monte Carlo event generators. New event generator configurations for the modelling of jet production, derived using ATLAS data will also be presented.

Additional comments

Author: CAMPANELLI, Mario (University College London (UK))

Co-author: ATLAS COLLABORATION

Presenters: CAMPANELLI, Mario (University College London (UK)); ATLAS COLLABORATION

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