Contribution ID: **423** Type: **Parallel talk**

Measurement of jet substructure observables using the ATLAS detector

Friday 12 July 2019 09:15 (15 minutes)

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 discuss a first measurement of such jet substructure quantities. The soft drop mass is measured in dijet events with the ATLAS detector at $\sqrt{s}$=13 TeV, unfolded to particle-level and compared to Monte Carlo simulations. We also present a measurement of substructure variables in ttbar and inclusive jet events, using data collected by the ATLAS experiment at $\sqrt{s}$ = 13 TeV. The measurements are performed with large-radius jets. They are corrected for detector effects, represented as particle-level distributions and are compared to the predictions of various Monte Carlo event generators. If available, a measurement of jet substructure observables performed using charged particles, at $\sqrt{s}$ = 13 TeV, is also presented. New event generator configurations for the modelling of jet production, derived using ATLAS data will also be presented.

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Session Classification: QCD and Hadronic Physics

Track Classification: QCD and Hadronic Physics