



Contribution ID: 990

Type: **Talk**

Probing QCD with Photons and Jets at the ATLAS Detector

Monday 28 August 2017 12:15 (25 minutes)

The production of jets and prompt isolated photons at hadron colliders provides a stringent test of perturbative QCD at the highest energies. The process can also be used to probe the proton structure.

The ATLAS collaboration has recently measured the inclusive and differential jet and dijet production cross section in data collected at a center-of-mass energy of 8 TeV and 13 TeV. We also present new measurements of transverse energy-energy correlations (TEEC) and their associated asymmetries (ATEEC) in multi-jet events at a center-of-mass energy of 8 TeV. The data is unfolded to the particle level and is used to extract the strong coupling constant and test the renormalization group equations. The Strong coupling constant is also extracted from a measurement of the dijet azimuthal decorrelation.

We will also present precise measurements of the inclusive production of isolated prompt photons at a center-of-mass energy of 13 TeV, differential in both rapidity and the photon transverse momentum. This will be complemented by measurements of isolated photon pair and tri-photon production 8 TeV. The production of prompt photons in association with jets combines jet and photon final states and provides an additional testing ground for perturbative QCD with a hard colourless probe less affected by hadronisation effects than jet production also. The ATLAS collaboration has studied the dynamics of isolated-photon plus jet production and of the isolated photon+heavy flavour final states in pp collisions at a centre-of-mass energy of 8TeV and 13 TeV, which will be presented and discussed.

All results have been compared with state-of-the-art theory predictions at NLO and NNLO in pQCD, interfaced with different parton distribution functions and can be used to constrain the proton structure.

Topic:

Topic: High Energy Particle Physics

Summary

Primary author: CALLEA, Giuseppe

Presenter: CALLEA, Giuseppe

Session Classification: Parallel session

Track Classification: A High Energy Particle Physics: