

Jet and photon probes of small collision systems with ATLAS

Wednesday, 3 October 2018 11:05 (20 minutes)

Measurements of photon and jet production in small collision systems are of great interest to understanding the partonic structure of heavy nuclei, and serve as a constraint on the initial state in large collision systems. These channels are sensitive to a broad set of physics effects such as the modification of the parton densities in nuclei, including the onset of non-linear QCD or saturation effects at low- x , and the energy loss of partons in the nucleus before the hard scattering. This talk presents new results from the ATLAS experiment on photon and dijet production in p +Pb collision data recorded in 2016. Photon yields are reported in 8.16 TeV p +Pb data over a large kinematic range, $p_T = 25$ -500 GeV and $|\eta| < 2.37$, and the production rates are compared to an extrapolated pp reference based on existing 8 TeV collision data. The measured spectra are used to construct nuclear modification factors and forward/backward ratios. These are compared to theoretical calculations of initial state energy loss and to the expectations from the modifications of parton distribution functions in nuclei. Additionally, new results on forward-forward and forward-central di-jet production are reported in 5.02 TeV p +Pb and pp collisions, including jets up to $y = 4$ in the center of mass frame. The measured azimuthal angular correlations and conditional yields are compared to theoretical calculations of the decorrelation and suppression expected from saturation effects.

Summary

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Session Classification: Parallel 4