Contribution ID: **140** Type: **Parallel**

Measurements of Jets and Jet Quenching in sqrt(s_NN)=2.76 TeV PbPb Collisions with the ATLAS Detector at the LHC

Tuesday, May 24, 2011 3:20 PM (20 minutes)

Jet quenching, the parton energy loss in the hot and dense medium created in ultra-relativistic heavy ion collisions, is a well-established experimental phenomenon at RHIC. However, existing single hadron, di-hadron and multi-hadron measurements from RHIC do not provide a complete understanding of the experimental results and do not sufficiently constrain theoretical models. Reconstructed jet measurements in heavy ion collisions are expected to significantly improve experimental sensitivity to quenching and to more stringently constrain theoretical descriptions of the quark/gluon-medium interaction. Thus, prior to its commencement, it was anticipated that the LHC heavy ion program would substantially advance the study of jet quenching by providing access to jets with transverse energies in excess of 100 GeV – sufficiently high that the underlying event would provide only a modest perturbation to the jet measurements. Immediately following turn-on of the LHC in November, 2010, that expectation was satisfied through the observation of large di-jet asymmetries that may indicate substantial jet quenching. In this talk we will present results from ATLAS measurements of single jet production, di-jet correlations and jet fragmentation in Pb+Pb collisions at $\sqrt{s_{NN}} = 2.76$~TeV. These results include an update on the original di-jet asymmetry analysis using the full statistics from the Fall 2010 LHC Pb+Pb run.

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Session Classification: Jets

Track Classification: Jets