

Offline monitoring and data quality of the ATLAS Resistive Plate Chambers at CERN Tier0 facility

Tuesday, 9 February 2010 12:50 (20 minutes)

Resistive Plate Chambers (RPC) were installed in the barrel region of ATLAS detector to provide the muon trigger (and a coarse measure of the “non-bending” phi coordinate) in the region $|\eta| < 1.05$. The RPC are gaseous detector which measure the muon trajectory with 3 cm strips in the bending plane (r-z) and in the orthogonal direction (r-phi) with few nanoseconds time resolution. The trigger is done in both projections and has a programmable threshold from about 5 to 20 GeV transverse momentum. A total of 596 RPC chambers were installed, arranged in three cylindrical layers. They cover an area of 3650 square meters and are equipped with 368000 read-out electronic channels. The monitoring and the control of such a large subsystem is crucial to maximize the physics reach of the experiment.

A dedicated tool was developed to perform the offline monitoring, to evaluate the quality of the RPC data and the detector performance. This tool is executed together with the reconstruction process at “Tier-0” CERN computer farm automatically at every run end. It provides detailed informations about the status of whole RPC subsystem and evaluates the relevant parameters for the detector operation like: the efficiency of strips and of single detectors part of a trigger tower, the noise rate, the cluster size and the space resolution, the time resolution and the coincidence timing.

In this work, after a description of the standalone monitoring code and the offline RPC data quality infrastructure, all the results of the monitoring will be reviewed. A detailed performance of ATLAS RPC subsystem will be presented using the large statistics of cosmic ray triggers collected during the commissioning period and first results with beam condition.

Primary author: Mr GUIDA, Angelo (INFN Lecce & Physics department of Salento University)

Presenter: Mr GUIDA, Angelo (INFN Lecce & Physics department of Salento University)

Session Classification: Status and performance of wide-gap RPC systems (II)