

Performance of the ATLAS Resistive Plate Chambers

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The ATLAS detector is now installed at CERN's LHC and fully operational. RPCs provide the first-level muon trigger and the measurement of the non bending coordinate in the barrel region. To achieve these goals, a system of about 4000 gas gaps operating in avalanche mode was built (resulting in a total of ~ 350000 readout strips).

Such a large-scale system allows the study of the performance of RPCs with unprecedented sensitivity to rare effects. On the other hand, a prerequisite for this kind of studies is the exact knowledge of the working point of the detector, and its uniformity along the whole muon spectrometer. This means fine-tuning thousands of parameters (involving both front end electronics and gap voltages), as well as constantly monitoring performance and environmental quantities such as gap/panel efficiencies, average cluster size, temperature, gas flow, gap currents, counting rates.

We will present here an overview of this effort and some example results, addressing in particular three aspects. First, the full exploitation of the high-precision tracking provided by ATLAS Monitored Drift Tubes when measuring the performance of the RPCs. Second, the use of a dedicated data stream to achieve the required statistics. Last, the central role of GRID facilities in providing the necessary computing resources.

Primary author: Mr CATTANI, Giordano (Department of Physics, University of Rome "Tor Vergata", INFN Rome "Tor Vergata")

Presenter: Mr CATTANI, Giordano (Department of Physics, University of Rome "Tor Vergata", INFN Rome "Tor Vergata")

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