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ATLAS Muon Spectrometer Monitoring using cosmic rays and First Beam Data

ATLAS is a large multipurpose detector, presently in the final phase of construction at LHC, the CERN Large Hadron Collider accelerator.

In ATLAS the Muon Spectrometer (MS) is optimized to measure final state muons of 14 TeV proton-proton interactions with a good momentum resolution of 2-3% at 10-100 GeV/c and 10% at 1 TeV, and an efficiency close to 100%, taking into account the high level background environment, the inhomogeneous magnetic field, and the large size of the apparatus (24 m diameter by 44 m length).

The complexity of the experiment, the number of electronics channels and the high rate of acquired events requires a detailed commissioning of the detector, during the installation phase of the experiment and in the early life of ATLAS, to verify the correct behaviour of the hardware and software systems.

This is done through the acquisition, monitoring, reconstruction and validation of calibration signals as well as processing data obtained with cosmic ray muons.

Tools to monitor the status of the ATLAS MS and determine the quality of the data are being developed.

The goal is to spot problems during data taking and flag the data. Careful monitoring of data is especially important at the beginning of an experiment where the environment is new and requires some experience to fully comprehend.

Therefore developing such tools can help the experiment to quickly determine problems and then proceed to solve them efficiently.

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