

Commissioning and performance of the ATLAS Transition Radiation Tracker with Cosmic Rays and first high energy collision at LHC

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The ATLAS Transition Radiation Tracker (TRT) is the outermost of the three sub-systems of the ATLAS Inner Detector at the Large Hadron Collider at CERN. It consists of close to 300000 thin-wall drift tubes (straws) providing on average 30 two-dimensional space points with 0.13 mm resolution for charged particle tracks with $|\eta| < 2$ and $p_T > 0.5$ GeV. Along with continuous tracking, it provides particle identification capability through the detection of transition radiation X-ray photons generated by high velocity particles in the many polymer fibers or films that fill the spaces between the straws. The front-end electronics implements two thresholds to discriminate the signals: a low threshold (< 300 eV) for registering the passage of minimum ionizing particles, and a high threshold (> 6 keV) to flag the absorption of transition radiation X-rays.

In this talk, a review of the commissioning and first operational experience of the TRT detector will be presented. Emphasis will be given to initial performance studies based on the reconstruction and analysis of several million cosmic ray tracks collected in the ATLAS cavern. In addition, the TRT response to LHC high energy proton-proton collisions will be presented here for the first time.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

http://atlas.ch/inner_detector3.html

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