

THE CERN LARGE HADRON COLLIDER: ACCELERATOR AND EXPERIMENTS

The ATLAS Experiment at the CERN Large Hadron Collider

ATLAS Collaboration

ABSTRACT: The ATLAS detector as installed in its experimental cavern at point 1 at CERN is described in this paper. A brief overview of the expected performance of the detector when the Large Hadron Collider begins operation is also presented.

KEYWORDS: ATLAS; LHC; CERN; Accelerator; Proton-proton collisions; Heavy-ion collisions; Minimum-bias events; Bunch-crossings; Pile-up; Superconducting magnets; Solenoidal field; Toroidal field; Magnetic field measurements; Hall probes; Inner detector; Charged-particle tracking; Vertex measurement; Pixel detectors; Silicon micro-strip detectors; Transition radiation; Time-over-threshold; Radiation-hard electronics; Fluorinert cooling; Carbon-fibre reinforced plastics; Optical fibres; Calorimetry; Sampling calorimeters; Liquid argon; Scintillator tiles; Electromagnetic and hadronic interactions; Forward calorimetry; Accordion geometry; Lateral segmentation; Longitudinal segmentation; Muon spectrometer; Precision-tracking chambers; Trigger chambers; Drift tubes; Thin-gap chambers; Resistive-plate chambers; Optical alignment systems; Forward detectors; Cerenkov light; Roman Pots; Zero-degree calorimetry; Trigger and data acquisition; High-level trigger; Event filter; Detector control system; Bandwidth; Processor farm; Electrons; Muons; Leptons; Photons; Jets; Taus; Missing transverse energy; b-tagging; Particle identification; Tracking algorithms; Vertexing algorithms; Impact parameter measurements.

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