

An integrated system for data quality and conditions assessment for the ATLAS Tile Calorimeter

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The ATLAS experiment records data from the proton-proton collisions produced by the Large Hadron Collider (LHC). The Tile Calorimeter is the hadronic sampling calorimeter of ATLAS in the region $|\eta| < 1.7$. It uses iron absorbers and scintillators as active material. Jointly with the other calorimeters it is designed for reconstruction of hadrons, jets, tau-particles and missing transverse energy. It also assists in muon identification. The TileCal is regularly monitored by several different systems, which were independently developed to meet distinct collaboration's requirements. Any problems are reported and immediately investigated. The data quality (DQ) efficiency achieved was 100% in 2015, 98.9% in 2016 and 99.4% in 2017. Changes to detector status or calibrations are entered into a dedicated conditions database called COOL. Experts maintain the tools used by DQ shifters and the calibration teams during normal operation, and prepare new conditions for data reprocessing and MC production campaigns.

Tile-in-ONE is a unique system, which integrates all the web DQ monitoring and calibration systems and tools used by the TileCal, with a standard development technology and documentation. It also intends to abstract the user from knowing where and how to get the wanted data by providing a user friendly interface. It is based in a server containing a core, which represents the basic framework that loads the configuration, manages user settings and loads plug-ins at run-time; a set of services, which provide common features to be used by the plug-ins, such as connectors to different databases and resources; and the plug-ins themselves which provide features at the top level layer for the users. Moreover, a web environment is being designed to allow collaborators develop their own plug-ins, test them and add them to the system. To make it possible, an API is used allowing any kind of application to be interpreted and displayed in a standard way.

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