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The Monitoring and Calibration Web Systems for the ATLAS Tile Calorimeter Data Quality Analysis

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The Tile Calorimeter (TileCal), one of the ATLAS detectors. has four partitions, where each one contains 64 modules and each module has up to 48 PhotoMulTipliers (PMTs), totalizing more than 10,000 electronic channels. The Monitoring and Calibration Web System (MCWS) supports data quality analyses at channels level. This application was developed to assess the detector status and verify its performance, presenting the problematic known channels list from the official database that stores the detector conditions data (COOL). The bad channels list guides the data quality validator during analyses in order to identify new problematic channels. Through the system, it is also possible to update the channels list directly in the COOL database. MCWS generates results, as etaphi plots and comparative tables with masked channels percentage, which concerns TileCal status, and it is accessible by all ATLAS collaboration. Annually, there is an intervention on LHC (Large Hadronic Collider) when the detector equipments (PMTs, motherboards, voltages and cables, for example) are fixed or replaced by new ones. When a channel needs to be repaired, the calibration constants stored into COOL database must be updated, otherwise they may negatively interfere in the data quality analyses. A MCWS functionality manages the calibration constants by updating their values in COOL database. The development team foresees an integration with the Tile detector control Web system (DCS) in order to automatically identify voltage problems, since the channels are fed by high voltage sources. The MCWS has been used by the Tile community since 2008, during the commissioning phase, and was upgraded to respect the ATLAS operation specifications.

Author: SIVOLELLA GOMES, Andressa (Univ. Federal do Rio de Janeiro (BR))

Co-authors: MAIDANTCHIK, Carmen (Univ. Federal do Rio de Janeiro (BR)); ATLAS, Collaboration (Atlas); GUIMARAES FERREIRA, Fernando (Univ. Federal do Rio de Janeiro (BR))

Presenter: SIVOLELLA GOMES, Andressa (Univ. Federal do Rio de Janeiro (BR))

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