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ATLAS Tile Calorimeter Software Tools for Data Quality Monitoring

The ATLAS Tile Calorimeter (TileCal) is the central hadronic calorimeter of the ATLAS detector at the Large Hadron Collider at CERN. It plays an important role in the reconstruction of jets, hadronically decaying tau leptons and missing transverse energy, and also provides information to the dedicated calorimeter trigger. The TileCal readout is segmented into nearly 10000 channels that are calibrated using the dedicated calibration systems such as laser, charge injection, integrator and Cesium source.

Data quality assurance is paramount, with collision and calibration data subject to rigorous scrutiny. Automated checks are performed on predefined histograms, and the results are summarized on dedicated web pages. Operators use a suite of tools to further inspect the data and identify any issues or irregularities. The TileCal conditions data, including calibration constants and channel statuses, are therefore regularly updated in databases. These databases are used for data reprocessing and are also crucial for maintenance work during the technical stops.

In this talk, we will discuss the software tools used for data quality monitoring, emphasizing recent advancements and our pursuit of consolidating multiple tools into a more streamlined web application. Our overarching goal is to optimize the efficiency of the shifters responsible for monitoring data quality while simultaneously simplifying the entire process.

Primary author: BOGAVAC, Danijela (CERN)

Presenter: BOGAVAC, Danijela (CERN)

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