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Real-time analysis of the operational state of the CMS strip tracker readout system

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The CMS silicon strip tracker comprises a sensitive area of >200 m2 and 10M readout channels. Its data acquisition system is based around a custom analogue front-end ASIC, an analogue optical link system and an off-detector VME board that performs digitization, zero-suppression and data formatting. The data acquisition system uses the CMS online software framework, known as XDAQ, to configure, control and monitor the hardware components and steer the data acquisition. Recent developments have seen the integration of the CMS offline software framework, known as CMSSW, within the online data acquisition system. This provides many new features and services within the online environment, such as distributed analysis within CMSSW, access to geometry and conditions data, and a monitoring framework. We review how the monitoring frameworks available within both XDAQ and CMSSW will be used to assess the operational state of the hardware components of the strip tracker readout system during data-taking and provide real-time feedback to shifters in the CMS control room. We will report on the software components, the chosen architecture, the various monitoring streams available, and our experiences of commissioning and operating large-scale systems at the tracker integration facility.

Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

CMS tracker collaboration

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