



Contribution ID: 588

Type: **Poster presentation**

ECAL DAQ system: electronics auto-recovery and monitoring

Tuesday 12 June 2018 15:55 (15 minutes)

The Compact Muon Solenoid (CMS) is a general-purpose detector operating at the LHC. The CMS Electromagnetic Calorimeter (ECAL), based on PbWO₄ crystals, has shown excellent performance with a very stable data acquisition system even during higher LHC luminosity peaks.

ECAL DAQ system follows a modular and scalar schema. During the data taking, the Front End electronics is prone to occasional errors, induced by particles interactions. If these errors are not handled opportunely they can cause data loss in the section affected or even blocking the data taking of the experiment.

To prevent these situations, an automatic recovery mechanism has been developed in the ECAL DAQ software. The software dedicated to the configuration of the boards have been modified to check periodically their status. Depending on the level of the error they can trigger a reconfiguration of a single component or of the full board, or even mask the affected section and exclude it from the resuming run.

In this frame it is crucial to provide to the experts a real time view of the electronics status. For this purpose a web application, running on a light JavaScript server framework based on Node.js and Express.js, has been developed.

It is composed by routines that cyclically collect the status of the electronics and expose the information to web requests. On client side, graphical interfaces, based on Vue.js libraries, ask for the data (only if new information are available) and show the main information of the electronics status and errors.

Minioral

No

Description

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Session Classification: Poster 1

Track Classification: Control, Monitoring, Test and Real Time Diagnostics Systems