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## Laser calibration system for TileCal sub-detector

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TileCal is the central hadronic calorimeter of the ATLAS experiment at LHC. It is a sampling calorimeter using iron as absorber and plastic scintillating tiles as active material. The scintillation light produced by the passage of particles is read by photomultipliers (PMTs). TileCal readout is segmented in around 5000 cells (longitudinally and transversally), each of them being read by two PMTs. Various systems are used to perform the calibration of the data acquisition chain, control its stability and convert the signal of the PMTs into an energy deposit. Amongst the calibration systems, a Laser device is used for the monitoring of the response and stability of the calorimeter at the level of the PMTs. This system sends a controlled light pulse via dedicated clear optical fibre to each of the 9852 PMTs composing the readout. It allows to monitor the stability of the gain of the PMTs, perform the timing adjustment of some parts of the readout electronics, and possibly recover from non-linearity problems occurring at very high energy deposit (saturation effects on the readout electronics). In this talk, we give a description of the Laser system (current hardware and foreseen improvements). The main applications of the Laser system (timing, gain monitoring, and linearity) are then described, and the results obtained during the last years of data taking are presented.

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