Contribution ID: **15** Type: **Talk**

Upgrade of the CMS Electromagnetic Calorimeter for the High-Luminosity LHC

Tuesday 3 September 2024 11:00 (20 minutes)

The High Luminosity upgrade of the LHC (HL-LHC) at CERN will provide unprecedented instantaneous and integrated luminosities of around 5 x 10^34 cm-2 s-1 and 3000/fb, respectively. The expected average of 140 to 200 collisions per bunch-crossing (pileup) represents a severe challenge for the detectors. In the barrel region of the CMS electromagnetic calorimeter (ECAL), the lead tungstate crystals and avalanche photodiodes (APDs) will operate at a lower temperature with respect to the present and the entire readout and trigger electronics will be replaced.

Each of the 61,200 ECAL barrel crystals will be read out by two custom ASICs providing signal amplification with two gains, ADC with 160 MHz sampling rate, and lossless data compression for the transmission of all channel data to the off-detector electronics. Trigger primitive generation by updated reconstruction algorithms as well as data acquisition will be implemented on powerful FPGA processors boards. The upgrade of the ECAL electronics will allow to maintain the excellent energy resolution of the detector and, in addition, to greatly improve the time resolution of electrons and photons above 10 GeV, down to a few tens of picoseconds.

This talk will present the design and status of the individual components of the upgraded ECAL barrel detector, and the results of energy and time resolution measurements obtained with the latest ECAL readout electronics prototypes using electron beams with energies of up to 250 GeV at the CERN SPS.

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

CMS, LHC - CERN

Is the speaker for that presentation defined?

No

Details

N/A

Internet talk

No

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