

Operational Experience with Radioactive Source Calibration of the CMS Hadron Endcap Calorimeter Wedges with Phase I Upgrade Electronics

Monday, May 22, 2017 4:18 PM (18 minutes)

The Phase I Upgrade of the CMS Hadron Endcap Calorimeters consist of new photodetectors (Silicon Photomultipliers in place of Hybrid Photo-Diodes) and front-end electronics (QIE11). The upgrade will allow the elimination of the high amplitude noise and drifting response of the Hybrid Photo-Diodes, at the same time enabling the mitigation of the radiation damage of the scintillators and the wavelength shifting fibers with a larger spectral acceptance of the Silicon Photomultipliers. The upgrade will also allow to increase the longitudinal segmentation of the readout to be beneficial for pile-up mitigation and recalibration due to depth-dependent radiation damage.

As a realistic operational exercise, the responses of the Hadron Endcap Calorimeter wedges are being calibrated with a ^{60}Co radioactive source both with current and upgrade electronics. The exercise will provide a manifestation of the benefits of the upgrade. Here we describe the instrumentation details and the operational experiences related to the sourcing exercise.

Primary author: BILKI, Burak (U)

Co-authors: KAMINSKIY, Alexander (Moscow State University); BENAGLIA, Andrea (Princeton University); GRIBUSHIN, Andrei (Moscow State University); SMITH, Caleb (Baylor University); TLISOV, Danila (Institute for Nuclear Research, Moscow, Russia); SCHMIDT, Ianos (University of Iowa); DITTMANN, Jay (Baylor University); KUNKLE, Joshua (University of Maryland); TOMS, Maria (Institute for Theoretical and Experimental Physics, Moscow, Russia); RUMERIO, Paolo (University of Alabama); BUNIN, Pavel (Joint Institute for Nuclear Research); DE BARBARO, Pawel (University of Rochester); COOPER, Seth (University of Alabama); OBRAZTSOV, Stepan (Moscow State University); ANDREEV, Vladimir (P.N. Lebedev Physical Institute, Moscow, Russia)

Presenter: BILKI, Burak (U)

Session Classification: R2-Experimental detector systems(1)

Track Classification: Experimental detector systems