

CMS Hadron Calorimeter Pulse Filter for Pileup Mitigation at the Level-1 Trigger

Thursday, May 27, 2021 5:12 AM (18 minutes)

We explore the possibility of mitigating the effects of out-of-time pileup by developing an alternative scheme for signal amplitude reconstruction that is done online for the CMS Hadron Calorimeter (HCAL). This new scheme makes use of information from bunch crossings preceding the one that would generate an accept decision for the Level-1 Trigger (L1T). The scheme employs basic pulse shape filtering techniques that are optimized specifically to minimize the effects of out-of-time pileup at the Level-1 trigger. We find that the overall L1T performance gets improved in terms of energy scale and resolution for L1 Trigger quantities and the new scheme will be used during Run3 operation of the L

TIPP2020 abstract resubmission?

Funding information

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Session Classification: Posters: Trigger and DAQ

Track Classification: Readout and Data Processing: Readout: Trigger and DAQ