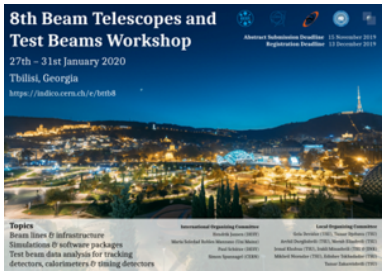

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The CMS ECAL Upgrade for Precision Crystal Calorimetry at the HL-LHC

Wednesday 29 January 2020 13:30 (20 minutes)

LHC Run-II finished at the end of 2018 after operating since 2015. During this time the electromagnetic calorimeter (ECAL) of the Compact Muon Solenoid (CMS) has been performing tremendously under very challenging conditions at a center-of-mass energy of 13 TeV and a bunch-spacing of 25 ns. The environment will be even more challenging for the ECAL after the the High-Luminosity upgrade of the LHC (HL-LHC) with up to 200 proton-proton collisions per bunch crossing and a considerably higher data rate. In regards to those challenges, the plan for the upgrade of the ECAL will be described in this presentation. One of the measures to mitigate the issues arising from the HL-LHC upgrade is to increase the sampling rate of the read-out electronics from 40 MHz to 160 MHz. Results from test beams of the new read-out and trigger electronics in the SPS H2 and H4 beam lines covering this aspect will be shown. As the conditions in the vicinity of the ECAL during the running of the HL-LHC will feature an unprecedented amount of radiation that can damage the detector, irradiation experiments with its components have been performed. Selected results from those will be reviewed.

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