Argonne NATIONAL LABORATORY

HEP Seminar

High Energy Physics Special Seminar

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"The CMS HGCAL - a High Granularity Calorimeter for High Luminosity LHC"

Host: Peter Winter

Wednesday, July 28, 2021 – 12:00pm-1:00pm

To join meeting on computer:
https://bluejeans.com/581344159/0070?src=calendarLink

Abstract:

The CMS collaboration has opted for a High Granularity Calorimeter (HGCAL) to replace the current endcap electromagnetic and hadronic calorimeters in the view of high-luminosity phase of the LHC (HL-LHC). The HL-LHC, expected to start around 2027, aims to accumulate proton proton collision data corresponding to an integrated luminosity of 3000/fb over a span of ten years, which is ten times more data than the ongoing phase of the LHC. High instantaneous luminosity needed to achieve these goals, will result in an average of 140 proton proton interactions per bunch crossing. These pose very stringent requirements on radiation tolerance of the endcap detectors as well as their pileup mitigation capabilities. The HGCAL is a silicon & scintillator based sampling calorimeter with unprecedented longitudinal and transverse granularity, which will facilitate efficient particle-flow reconstruction, particle identification and pileup rejection.

The CMS HGCAL collaboration is extensively testing the detector components and its associated electronics in test bench based experiments and in beam test experiments with single particles. In 2018, a prototype of a section of HGCAL, was exposed to the beams of positrons and charged pions with momenta ranging from 20 to 300 GeV/c, and muons of 200 GeV/c. In this talk, I will discuss the commissioning and calibration of the HGCAL prototype, and its performance to the electromagnetic and charged hadron showers.

The HEP Special Seminar Schedule can be viewed at:
https://indico.fnal.gov/event/50153/