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Thermal and electrical performance tests of ATLAS silicon strip detector modules at BNL

Saturday, 9 April 2022 15:40 (20 minutes)

The inner tracking detector of the ATLAS experiment at CERN is currently preparing for an upgrade to operate in the High Luminosity LHC, scheduled for the late 2020s. A complete replacement of the existing Inner Detector of ATLAS is required to cope with the expected luminosity and radiation damage. The all-silicon Inner Tracker (ITk) design under construction composes a mixture of Pixel and Strips layers. At the core of the strip, barrel detector is the stave, thermo-mechanical support structures, each of which hosts 28 silicon modules. A thorough characterization of the modules before the assembly on each stave is critical; thus, each module has to undergo electrical and thermal quality control (QC) testing between module production and stave assembly. The modules are thermal cycled ten times between -35C and +40C. This talk will discuss the thermal and electrical performance of the US testing setup, focusing on the difficulties encountered to meet the QC requirements. It will also give an overview of the results obtained by analyzing the first batch of produced modules during pre-production.

Career stage

Graduate student

Author: SHARMA, Punit (University of Iowa (US))

Presenter: SHARMA, Punit (University of Iowa (US))

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