

Abstract Submitted
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Thermal imaging QC for silicon strip staves of the ATLAS phase II upgrade CARLOS VERGEL INFANTE, Iowa State University — A new silicon strip detector is part of the phase II upgrade of the ATLAS inner tracker. Light-material carbon fiber honeycomb sandwich staves serve as mechanical support for the strip sensors and readout modules and to move the dissipated heat out of the detector. A cooling pipe inside the stave is embedded in heat-conducting foam that thermally connects the pipe with the readout modules. The staves are required to pass a set of quality control (QC) tests before they are populated with readout modules. One test uses a non-invasive inspection method of infrared (IR) thermal imaging of the heat path while the stave is cooled to around -40°C at ambient room temperature. Imperfections in the manufacturing, such as the delamination of the stave facing from the foam, will exhibit a different temperature profile compared to a flawless stave. We report on the current status of the thermal imaging QC measurements including a characterization of various contributions to the uncertainties in the temperature reading of the IR camera such as pedestal variations, common-mode noise, vignetting, and statistical fluctuations across the field of view.

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