

Slow control system development for the thermal cycle of the ITk Strip staves

The ATLAS experiment at the Large Hadron Collider is preparing for a significant upgrade of the Inner Detector for the High-Luminosity LHC operation, scheduled to start in 2027. A planned integrated luminosity of 4000 fb⁻¹ requires a complete replacement of the existing ID. An all-silicon Inner Tracker is under development with a pixel detector surrounded by a strip detector. BNL is in charge of building half of The Strip detector.

The mechanical building blocks of the detector are the staves which host the electrical and cooling services as well as 28 modules. As the detector will be operated at cold temperature (-45C) to cope with radiation damage, part of the quality control during production consists in testing the reliability of the staves at such low temperatures, in a process called thermal cycle. A box equipped with chiller, temperature and humidity sensors has been built to perform all necessary measurements. In this presentation, we'll show the development and the progress made on the slow control system of the box.