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System tests for prototypes of the ATLAS ITK pixel detector

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The current ATLAS Inner detector will be replaced with a new all silicon Inner Tracker (ITK) to cope with the high density environment during High Luminosity LHC (HL-LHC). The innermost part of the ITK will comprise a state-of-the-art pixel detector. This pixel detector is built upon lightweight carbon structures in the shape of rings and staves, which host the pixel modules. Designing proper system tests on these loaded supports is very crucial in building the detector fulfilling the requirements. Prototypes of these supports, employing the RD53A readout chip, have been fabricated and subjected to system-level studies and development of final qualification procedures. Preliminary system tests have been designed and conducted to assess aspects which are essential for detector operation, like thermal performance with CO_2 cooling, serial power, grounding, shielding, system monitoring, and the overall performance of the multi-module detector systems. This contribution outlines the ongoing testing on these loaded supports and provides insights into some of the system test outcome which in return will help improving the test procedures.

Early Career

Yes

Primary author: ZHENG, Zhi (SLAC)

Presenter: ZHENG, Zhi (SLAC)

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