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First lpGBT-based prototype of the End-of-Substructure (EoS) card for the ATLAS Strip Tracker Upgrade

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The central building blocks of the ATLAS Strip Tracker Upgrade are the staves and petals which host up to 14 modules per side. The incoming data is sent to the EoS and multiplexed by the lpGBT chips on 10 Gbit/s links and sent via optical transmitters (VL+) off-detector. The EoS is a critical component for the upgrade, sitting at a single-point-of failure location. Prototype boards have been designed, manufactured and tested using the first available lpGBT and VL+ prototypes from CERN. We present the first test results and give an outlook towards the production of 2000 boards using these chips.

Summary

We have produced first prototypes using the first available versions of the lpGBT and VL+ ASICS's. Presented will be the design of the electronics, the exercised tests for electrical behavior, mechanical deformation and thermal behavior. By the use of the EoS for substructure tests experience for detector level performance is gained. Since each EoS sits at a single-point-of-failure for an entire stave or petal side, a dedicated quality control and assurance procedure for the planned 2000 EoS PCBs has been developed and will be presented as well.

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