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## Design, Production, and Reliability of the New ATLAS Pixel Opto-Boards

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New fiber optic transceivers, opto-boards, were designed and produced to replace the first generation opto-boards installed on the ATLAS pixel detector and for the new pixel layer. Each opto-board contains one 12-channel PIN array and two 12-channel VCSEL arrays along with associated receiver/driver ASICs. The new opto-board design benefits from the first generation production and operational experience and contains several improvements. Most of the new opto-boards have been installed with completion expected in early June. We will present the design, production and operational experience, and reliability study of the new opto-boards.

### Summary

The Large Hadron Collider (LHC) at CERN (Geneva) is now the highest energy and luminosity collider in the world. The collider is currently in a period of maintenance in order to increase the center-of-mass energy from 7 to 13 TeV. The pixel detector of the ATLAS experiment contains four barrel layers and three disks on each end. The inner barrel layer (insertable barrel layer, IBL) is the new addition installed during this shutdown. New opto-boards have been fabricated for the new pixel system for two reasons: 1) the IBL requires a new version of opto-boards; 2) the installation site of the opto-boards for the older pixel detector has been moved to a more accessible location.

A post-mortem has been performed on the first generation opto-boards removed from the older pixel detector. The

Each new opto-board contains one 12-channel PIN array and two 12-channel VCSEL arrays. However, only the inner

The production of the opto-boards is now completed. The production experience was quite positive although some

All opto-boards have been installed except those for the IBL which will be installed in early June. The installa

The long-term reliability of the opto-boards has been extensively studied. The industry standard is that some s

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