

# ACES 2018 - Sixth Common ATLAS CMS Electronics Workshop for LHC Upgrades



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## Optical transmitter (MTx+) and transceiver (MTRx+)

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We present an optical transmitter (MTx+) and transceiver (MTRx+) based on LC TOSA and ROSA. The transmitter uses a VCSEL driver (LOClD65) of the 65 nm CMOS technology. LOClD65 is tested up to 14 Gbps. The receiver uses the ROSA/GBTIA for the moment. The electrical connector is the same as that of a SFP+. Both MTx+ and MTRx+ receive multimode fibers with the standard LC connector. The module is 6 mm in height and can be panel or board mounted. Measurement results will be present. MTx+ and MTRx+ with evaluation boards can be obtained for further development.

### Summary

Using the CERN chosen 65 nm CMOS technology we have developed a dual-channel VCSEL driver, LOClD65, following the same concept of LOClD, the VCSEL driver that has been developed for MTx and MTRx, both are optical modules for ATLAS phase-1 LAr trigger upgrade. MTx and MTRx are 6 mm in height to meet the mechanical requirement in LAr. LOClD65, a 1 mm<sup>2</sup> die packaged in QFN24, has been tested to meet its design goal of 14 Gbps transmission rate per channel. Using this ASIC, we have developed MTx+ and MTRx+ to push the optical modules' data rate to 10 Gbps range. In doing that, we made the following improvements: the electrical connector is changed to the standard connector for SFP+, the optical connector is now the standard LC connector. The modules stay below 6 mm and can be both panel and board mounted. Prototypes of the optical modules with the carrier boards for evaluations are available for system level development, and may be suitable for testing lpGBT that is coming out soon. We present these modules as a TOSA and ROSA based optical modules that match with lpGBT.

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**Session Classification:** Posters (from Tuesday am to Thursday pm)