Contribution ID: **189** Type: **Oral Presentation**

Directly Modulated 850 nm Multimode VCSEL Performance Analysis for Short Reach Optical Communications

Tuesday, 26 June 2018 12:20 (20 minutes)

Abstract:
Short reach optical interconnects must support higher data rates to manage the increasing needs of end users and the commensurate increase in storage and computation within and between data centres. Multimode vertical cavity surface-emitting lasers (VCSELs) and multimode fibre (MMF) links provide a power efficient solution, which is achieved in part by maximizing the data rate per transmission channel. We experimentally analyze the performance of a 10 Gbps 850 nm multimode VCSEL for adoption in high-speed VCSEL-MMF based short range optical interconnects. Results show that an error-free operation at 10 Gbps is achieved at back-to-back (B2B) configuration with less than 0 dBm of received optical power. A successful transmission over OM3 optical fibre is achieved with a clearly open eye diagrams. Results from this work indicate that 850 nm multimode VCSELs have the potential for reliable operation over OM3 optical fibres. They are therefore ideal candidate for bandwidth demanding shor-range applications.

Keywords: VCSEL, MMF, OM3, fibre, optical interconnects

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Session Classification: Applied Physics

Track Classification: Track F - Applied Physics