

300 Gbps Short-Reach C-Band Optical Links

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ABSTRACT

Exchange of information in fast, reliable and secure way with access anywhere is a must for a modern society. This leads to emerging traffic in Data Centers imposing tight requirements for short-reach optical links [1]. Research activities around next generation GbE interfaces requires wavelength division multiplexing (WDM) for short-reach optical links. Therefore C-band for intensity modulation direct detection (IMDD) short-reach optical communications is even more attractive [2]. In this talk we review experimental intensity modulation and direct detection demonstrations for short reach optical links. Furthermore, we evaluate 330-Gbps line rate with 128 quadrature amplitude modulation (QAM) discrete multitone (DMT) [3] and 300 Gbps line rate with 100 Gbaud 8-level pulse amplitude modulation (PAM8) [4] IMDD transmission after 400 meters below pre-forward error correction (FEC) bit error rate (BER) with a single packaged externally modulated laser (EML), a DAC and a packaged InP photo-detector (PD) in C-band [5].

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REFERENCES

- [1] O. Ozolins *et al.*, "Multilevel modulation at 100 Gbaud for short reach C-band links [invited]," in *Proc. ICTON*, 2019, paper Th.D3.1.
- [2] O. Ozolins *et al.*, "100 GHz externally modulated laser for optical interconnects," *J. Lightwave Technol.*, vol. 35, no. 6, pp. 1174-1179, 2017.
- [3] L. Zhang *et al.*, "Lattice pilot aided DMT transmission for optical interconnects achieving 5.82-bits/Hz per lane," in *Proc. ECOC*, 2019, paper Tu.3.D.
- [4] O. Ozolins *et al.*, "100 Gbaud PAM4 link without EDFA and post-equalization for optical interconnects," in *Proc. ECOC*, 2019, paper Th.2.A.
- [5] O. Ozolins *et al.*, "300+ Gbps short-reach optical communications [invited]," in *Proc. CLEO*, 2020, paper We.3.A.