

Experimental Comparison of 56 Gbit/s PAM-4 and DMT for Data Center Interconnect Applications - DTU Orbit (08/11/2017)

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Four-level pulse amplitude modulation (PAM-4) and discrete multi-tone transmission (DMT) in combination with intensity modulation and direct-detection are two promising approaches for a low-power and low-cost solution for the next generation of data center interconnect applications. We experimentally investigate and compare both modulation formats at a data rate of 56 Gb/s and a transmission wavelength of 1544 nm using the same experimental setup. We show that PAM-4 outperforms double sideband DMT and also vestigial sideband DMT for the optical back-to-back (b2b) case and also for a transmission distance of 80 km SSMF in terms of required OSNR at a FEC-threshold of 3.8×10^{-3} . However, it is also pointed out that both versions of DMT do not require any optical dispersion compensation to transmit over 80 km SSMF while this is essential for PAM-4. Thus, implementation effort and cost may be lower for DMT. Furthermore, the dispersion tolerance of PAM-4 in dependence of a feedforward equalizer (FFE) is investigated.

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