Reach Extension and Capacity Enhancement of VCSEL-Based Transmission Over Single-Lane MMF Links - DTU Orbit (14/12/2018)

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This paper reviews and examines several techniques for expanding the carrying capacity of multimode fiber (MMF) using vertical cavity surface emitting lasers (VCSELs). The first approach utilizes short wavelength division multiplexing in combination with MMF optimized for operation between 850 and 950 nm. Both nonreturn to zero (NRZ) and four-level pulse amplitude modulation (PAM4) signaling are measured and demonstrate up to 170-Gb/s postforward error correction transmission over 300 m. For single wavelength transmission, the use of selective modal launch to increase the optical bandwidth of a standard OM3 MMF to more than 2.1 GHz·km for standard MMF is presented. A statistical model is used to predict the bandwidth enhancement of installed MMF and indicates that significant link extension can be achieved using selective modal launch techniques. These results demonstrate the continued effectiveness of VCSEL-based MMF links in current and future data center environments.

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