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Enhancing the capacity and propagation distance of VCSELs based MMF links

Lightwave communication system enables enormous data carrying capacity for data communication applications. A typical light-wave system consists of a transmitter, a transmission channel and a receiver. The optical fibers are the heart of the light communication system. These are utilized as a transmission channel to carry the modulated light signal. The propagating light pulse is affected by dispersion which causes pulse spreading. Dispersion limits the maximum distance the pulse can travel and the data carrying capacity or bandwidth of the optical link. In the past, several techniques have been invented to increase the capacity of fiber transmission systems and to mitigate the modal and chromatic dispersion. These include different multiplexing schemes, advanced modulation formats, equalization techniques and selective mode launch methods. Our research is focused on bandwidth enhancement of multimode fiber links with vertical cavity surface emitting (VCSEL) lasers. We are utilizing short wavelength division multiplexing (SWDM) in combination with different modulation techniques and novel fiber types. We present results for SWDM with OM4 fiber with both non-return to zero (NRZ) and four-level pulse amplitude modulation (PAM4). Furthermore, solutions for improving the bandwidth of links with OM3 fiber will be discussed. Recognizing the fabrication shortcomings of existing OM3 fibers, suitable fiber launch conditions can lead to a significant increase of link bandwidth and reach. Experiments are presented that compare link performance with and without selective fiber launch. The results will be elaborated in the presentation.

Biography

Richa Dubey has completed her PhD from Ecole Polytechnique Federale of Lausanne (EPFL), Switzerland in Optics and Photonics domain. Her PhD work is focused on designing and characterizing 2-dimensional nano-optical components for an integrated optical system for commercial optical communication applications. As a part of her PhD, she has contributed to the significant advancement in the field of 2D optics on surface waves dielectric platform. Currently, she is working with Finisar Corporation as a Senior Optical Systems Scientist in the R&D department. Voluntarily, she is serving as a member of OSA technical groups and reviewer of several reputed peer-reviewed journals.

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