

# Performance of a Direct-Detection Spot Mode Division Multiplexing in Multimode Fiber

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## **Abstract:**

*Multimode fiber (MMF) regarded as an excellent choice for providing large capacity and high-speed for applications such as data centers due to its adaptability and unwavering quality. The ceaseless development and the increase of Internet users that emphasis on increasing data capacity have promoted mode division multiplexing (MDM) as a promising contender for providing further level of multiplexing freedom by propagating several and dissimilar channels in different mode stream. This paper investigates and analyzes the effects of launching MDM spot mode with various vortex order using vertical cavity surface-emitting laser array in conjunction with equalization scheme. A capacity of 40 Gbit/s transmitted over MMF long distance of 1500 m has been achieved at a wavelength of 1550.12 nm.*