Few-mode fiber, splice and SDM component characterization by spatially-diverse optical vector network analysis - DTU Orbit (21/12/2018)

Few-mode fiber, splice and SDM component characterization by spatially-diverse optical vector network analysis

This paper discusses spatially diverse optical vector network analysis for space division multiplexing (SDM) component and system characterization, which is becoming essential as SDM is widely considered to increase the capacity of optical communication systems. Characterization of a 108-channel photonic lantern spatial multiplexer, coupled to a 36-core 3-mode fiber, is experimentally demonstrated, extracting the full impulse response and complex transfer function matrices as well as insertion loss (IL) and mode-dependent loss (MDL) data. Moreover, the mode-mixing behavior of fiber splices in the few-mode multi-core fiber and their impact on system IL and MDL are analyzed, finding splices to cause significant mode-mixing and to be non-negligible in system capacity analysis.

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