Abstracts

Dispersion Effects in Optical Millimeter-Wave Systems Using Self-Heterodyne Method for Transport and Generation

R. Hofstetter, H. Schmuck and R. Heidemann. "Dispersion Effects in Optical Millimeter-Wave Systems Using Self-Heterodyne Method for Transport and Generation." 1995 Transactions on Microwave Theory and Techniques 43.9 (Sep. 1995, Part II [T-MTT] (Special Issue on Microwave and Millimeter Wave Photonics)): 2263-2269.

This paper describes the detrimental effects of chromatic and polarization mode dispersion (PMD) on systems using single-laser-based optical self-heterodyning for generation and transport of millimeter (mm) -wave signals. The decrease of the generated mm-wave power due to chromatic dispersion in conjunction with nonnegligible laser phase noise is calculated and experimentally verified. Considering statistical properties of the PMD an analytical expression for the cumulative probability distribution of the power penalty is found and used to determine the required system margin for a given system outage rate. Furthermore, two system experiments using ASK and DPSK modulation scheme, respectively, are presented showing no limitation due to the dispersion effects.

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