Abstracts

Nonlinear photodetection scheme and its system applications to fiber-optic millimeter-wave wireless down-links

M. Tsuchiya and T. Hoshida. "Nonlinear photodetection scheme and its system applications to fiber-optic millimeter-wave wireless down-links." 1999 Transactions on Microwave Theory and Techniques 47.7 (Jul. 1999, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1342-1350.

We report on our study on the nonlinear photodetection (NL-PD) scheme, which we have proposed and demonstrated as an extremely simple configuration for the optoelectronic millimeter-wave (MM-wave) mixing. The topics described in this paper are as follows: (1) advantageous optical MM-wave link architectures employing the NL-PD techniques; (2) operation principle of NL-PD; (3) detailed characterization of optoelectronic MM-wave mixer properties of a waveguide p-i-n photodiode; (4) experimental demonstration of NL-PD performance in analog and digital fiber-optic MM-wave transmission over a 30 km single-mode fiber; and (5) proposal of its possible applications to fiber-optic MM-wave wireless down-links, such as passive antenna base stations and coax-wireless-hybrid fiber-optic CATV systems.

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