Abstracts

Simultaneous electrooptical upconversion, remote oscillator generation, and air transmission of multiple optical WDM channels for a 60-GHz high-capacity indoor system

K. Kojucharow, M. Sauer, H. Kaluzni, D. Sommer, F. Poegel, W. Nowak, A. Finger and D. Ferling. "Simultaneous electrooptical upconversion, remote oscillator generation, and air transmission of multiple optical WDM channels for a 60-GHz high-capacity indoor system." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2249-2256.

The system concept and data transmission experiments for a mobile broad-band communication system at 60 GHz are presented in this paper. Dense wavelength division multiplexing (DWDM) is advantageously applied for simultaneous electrooptical upconversion of all optical channels carrying individual intermediate-frequency signals by means of a single external modulator. Thus, simple, but flexible, millimetric signal generation is obtained. Using this concept, data transmission experiments at 60 GHz have been carried out. Furthermore, the transponder noise performance is analyzed. Results of coded and uncoded 512-carrier orthogonal frequency division multiplex transmission with 50-Mb/s (subcarrier modulation quaternary phase-shift keying), 100 Mb/s (subcarrier modulation 16-quadrature amplitude modulation) as well as single-carrier modulation at 156 Mb/s utilizing three operational DWDM channels are presented. Uplink and downlink transmission has been realized. The significant performance improvement due to the application of coding is demonstrated in some experiments and line-of-sight transmission is compared to nonline-of-sight transmission. Low bit error rates, employing realistic air link conditions, have been obtained in all experiments.

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