Abstracts

Multifunctional fiber-optic microwave links based on remote heterodyne detection

U. Gliese, T.N. Nielsen, S. Norskov and K.E. Stubkjaer. "Multifunctional fiber-optic microwave links based on remote heterodyne detection." 1998 Transactions on Microwave Theory and Techniques 46.5 (May 1998, Part I [T-MTT]): 458-468.

The multifunctionality of microwave links based on remote heterodyne detection (RHD) of signals from a dual-frequency laser transmitter is discussed and experimentally demonstrated in this paper. Typically, direct detection (DD) in conjunction with optical intensity modulation is used to implement fiber-optic microwave links. The resulting links are inherently transparent. As opposed to DD links, RHD links can perform radio-system functionalities such as modulation and frequency conversion in addition to transparency. All of these three functionalities are presented and experimentally demonstrated with an RHD link based on a dual-frequency laser transmitter with two offset phase-locked semiconductor lasers. In the modulating link, a 1-Gb/s baseband signal is QPSK modulated onto a 9-GHz RF carrier. The frequency converting link demonstrates up-conversion of a 100-Mb/s PSK signal from a 2-GHz carrier to a 9-GHz carrier with penalty-free transmission over 25 km of optical fiber. Finally, the transparent link transmits a standard FM video 7.6-GHz radio-link signal over 25 km of optical fiber without measurable distortion.

❑ Return to main document.