Abstracts

Optical Fiber Delay-Line Signal Processing

K.P. Jackson, S.A. Newton, B. Moslehi, M. Tur, C.C. Cutler, J.W. Goodman and H.J. Shaw. "Optical Fiber Delay-Line Signal Processing." 1985 Transactions on Microwave Theory and Techniques 33.3 (Mar. 1985 [T-MTT]): 193-210.

Single-mode optical fiber is an attractive delay medium for processing microwave frequency signals due to its extremely low loss (<0.1 dB/µs) and large available time-bandwidth product (in excess of 10/sup 5/). Recent progress in the efficient tapping of light from single-mode fibers has made it possible to construct recirculating and nonrecirculating (tapped) delay-line structures that can perform a variety of important signal processing functions. These functions include coded sequence generation, convolution, correlation, matrix-vector multiplication, and frequency filtering. This paper presents the fundamental properties of single-mode fiber delay lines and reviews recent experimental results that demonstrate the feasibility of fiber delay-line devices for broad-band signal-processing applications.

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