Abstracts

Sinusoidal drives for optical time demultiplexers

R.C. Williamson, J.L. Wasserman, G.E. Betts and J.C. Twichell. "Sinusoidal drives for optical time demultiplexers." 2001 Transactions on Microwave Theory and Techniques 49.10 (Oct. 2001, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1945-1949.

Electrically driven arrays of optical switches can be used to time demultiplex a train of high-repetition-rate optical pulses into parallel lower speed circuits. These demultiplexers are used to advantage in high-speed communication systems and in photonic analog-to-digital converters. High-speed operation of an optical demultiplexer is simplified by the use of sinusoidal electrical drives, but suppression of crosstalk is difficult. Adequate suppression of crosstalk in these demultiplexers can be obtained through the use additional modulators. The key to our approach is the use of a combination of harmonically related sinusoidal signals applied to the additional modulators in order to select one out of every M pulses. Results with a 1: 4 demultiplexed photonic analog-to-digital converter operating at 208 MS/s demonstrate the efficacy of the technique.

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