LICENSING OPPORTUNITY: SERRODYNE FREQUENCY SHIFT SPECTROMETER AND SERRODYNE FREQUENCY SHIFTING

DESCRIPTION

Problem

Previously used methods, in many cases required Acousto-optic modulators which are relatively expensive and have narrow bandwidth. They can also be difficult to fabricate in integrated photonics platforms.

Invention

A serrodyne modulation (i.e., using a sawtooth waveform to produce a linear phase chirp) is performed using an electro-optic phase modulator in order to provide the needed frequency shift.

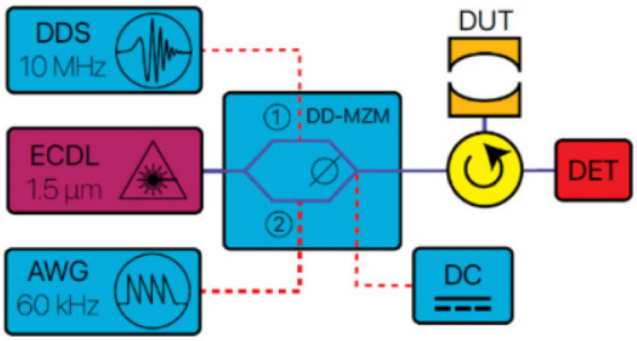
BENEFITS

Commercial Application

This provides a pathway for comb generation and operation in a chip-scale package. This approach also reduces cost and complexity by reducing the number of components and fabrication steps.

Competitive Advantage

This lowers the associated cost by removing the need for a series of fiber optic splitters and individual modulators. The associated noise is expected to be lower given the strong common-mode nature of the comb generation and the reduction of overall fiber length and number of components.



A schematic of the single-modulator, direct frequency comb spectrometer. Abbreviations are: direct digital synthesizer (DDS), external-cavity diode laser (ECDL), arbitrary waveform generator (AWG), electro-optic phase modulator (EOM), acousto-optic modulator (AOM), device under test (DUT), photodiode detector (DET), dual-drive Mach–Zehnder modulator (DD-MZM).

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