

LICENSING OPPORTUNITY: SERRODYNE FREQUENCY SHIFT SPECTROMETER AND SERRODYNE FREQUENCY SHIFTING



DESCRIPTION

Problem

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

Invention

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

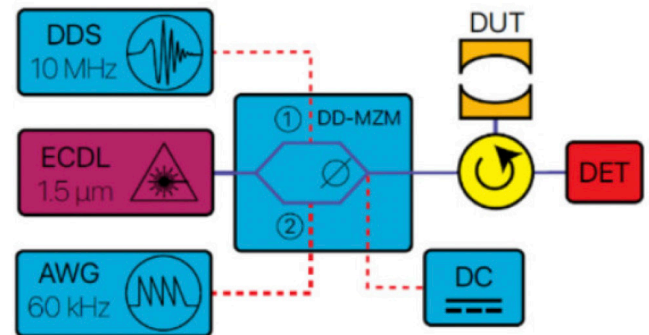
BENEFITS

Potential Commercial Applications

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 eliminating the need for a series of fiber optic splitters and individual modulators. Given the strong common-mode nature of the comb generation and the reduction of overall fiber length and number of components, the associated noise is expected to be lower.



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).

