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LINEARIZING OPTICAL FREQUENCY SWEEP OF A DFB LASER BY MODULATION WAVEFORM OPTIMIZATION FOR HIGH RESOLUTION FMCW SENSING SYSTEM

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ABSTRACT

Nonlinear in optical beat frequency will degrade the accuracy of the measurement system since it causes the spectrum to smear, making it hard to determine the target range and range resolution. Continuous research are kept going to ensure the system achieve highest linearity in beat frequency directly and accuracy in range measurement wholly.Our latest finding shows that waveform modifying technique is a very promising method to achieve linearity in the beat frequency. A linear optical frequency sweep can be achieved by modifying the modulation waveform of a laser diode. The modified modulation waveform is obtained by sampling the original modulating triangular waveform with the interference signal of an optical .The outcomes of this is linear optical frequency sweep that later contribute to linear beat frequency. In this report we also presenting other criteria and parameters during the experiment that are important in reducing the nonlinearity in beat frequency. Properselection of those parameter and technique, can sharpen the frequency spectrum which contribute to range measurement system's accuracy.

KEYWORDS: FFT Analysis, Linearity, Modulation Amplitude, Optimum Linearity of Beat Frequency, Repetition Frequency, Skip Function, Spectral Width, Zeros Function.

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