

A UNIQUE APPROACH TO FREQUENCY-MODULATED CONTINUOUS-WAVE
RADAR DESIGN

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ABSTRACT

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Frequency-Modulated Continuous-Wave (FMCW) Radar has traditionally been used in short range applications. Conventional FMCW radar requires the use of expensive microwave mixers and low noise amplifiers. A uniquely inexpensive solution was created, using inexpensive Gunn oscillator based microwave transceiver modules that consist of 3 diodes inside of a resonant cavity. However these transceiver modules have stability problems which cause them to be unsuitable for use in precise FMCW radar applications, when just one module is used. In order to overcome this problem, a unique radar solution was developed which uses a combination of 2 transceiver modules to create a precise FMCW radar system. This unique solution to FMCW radar is proven to be capable of determining range to target, and creating Synthetic Aperture Radar images.

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