

OFDM Radar for Detecting a Rayleigh Fluctuating Target in Gaussian Noise

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Abstract : We develop methods for detecting a target for orthogonal frequency division multiplexing (OFDM) based radars. As a preliminary step we introduce the target and Gaussian noise models in discrete-time form. Then, resorting to match filter (MF) we derive a detector for two different scenarios: a non-fluctuating target and a Rayleigh fluctuating target. It will be shown that a MF is not suitable for Rayleigh fluctuating targets. In this paper we propose a reduced-complexity method based on fast Fourier transform (FFT) for such a situation. The proposed method has better detection performance.

Keywords : constant false alarm rate (CFAR), match filter (MF), fast Fourier transform (FFT), OFDM radars, Rayleigh fluctuating target

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