

Radar Micro-Doppler Signatures

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This presentation explains basic principles and applications of the micro-Doppler signatures of radar targets. A micro-Doppler signature is a distinctive characteristic of the intricate frequency modulations generated from each component part of a target and represented in the joint time and Doppler frequency domain. Micro-Doppler signatures provide unique target features. This presentation describes the radar micro-Doppler effect, the mathematic and dynamic models of targets with various motions, the analysis of micro-Doppler signatures, and present the-state-of-the-art of applications of radar micro-Doppler signature analysis to target detection, characterization, and classification. Radar data returned from rigid body motion and non-rigid body motion will be used in the presentation examples as well as simulations. Examples are shown from state-of-the-art radars in both anechoic chambers and realistic environments.