

AIRCRAFT MICRO-DOPPLER FEATURE EXTRACTION FROM HIGH RANGE RESOLUTION PROFILES

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Abstract

The use of high range resolution measurements and the micro-Doppler effect produced by rotating or vibrating parts of a target has been well documented. This paper presents a technique for extracting features related to helicopter rotors and aircraft propellers from high range resolution profiles. The two features extracted are rotation rate harmonic (related to the rotation rate and number of blades of the scattering propeller/rotor) and the relative down range location of modulating propeller/rotor. These features provide valuable information for the classification and identification of airborne targets. The proposed algorithm was developed using simulated X-band data generated based on high quality CAD models of actual aircraft. The results indicate that, provided certain measurement parameters are chosen correctly and the SNR is sufficiently high, it is feasible to extract these features successfully.