论文

# 一种结合时频分析与Dechirp技术提高运动目标参数估计精度的多通道方法

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# A High Accurate Method of Estimating Moving Target's Parameters Using Time-frequency Analysis and Dechirp Technology with Multi-channel

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摘要 传统相位中心偏置天线(DPCA)和沿迹干涉(ATI)方法无法解决动目标方位向速度引起的散焦对于动目标检测和参数估计带来的影响，而且无法对动目标方位向速度做出估计。为了解决这一问题，该文提出一种结合修正离散Chirp-Fourier变换(MDCFT)与去调频(Dechirp)技术的多通道动目标检测方法，通过对动目标多普勒参数的精确估计，完成对动目标的聚焦，从而提高动目标距离向速度和方位向位置的估计精度，同时还可以比较精确地估计出动目标的方位向速度，弥补了DPCA和ATI方法的不足。理论分析和计算机仿真结果验证了该方法的有效性。

关键词： 合成孔径雷达　地面运动目标检测　时频分析　修正离散Chirp-Fourier变换　去调频

Abstract： Traditional approaches, such as the Displaced Phase Center Antenna (DPCA) and Along Track Interferometer (ATI), fail to mitigate the negative impact on the detection of?a target and the estimation of the parameters due to the defocus problem associated with the target's azimuth velocity. In addition, these two approaches also fall short in estimating the target's azimuth velocity. To solve above problems, this paper proposes a multi-channel moving target detection method which combines the time-frequency analysis method of Modified Discrete Chirp-Fourier Transformation (MDCFT) and dechirp technology. Through accurately estimating?a moving target's doppler parameters, the proposed method can realize the focusing of?the moving target. As a result, the accuracy of estimation on the moving target's radical velocity, azimuth position, as well as azimuth velocity can be significantly improved. In all, the proposed method can overcome the disadvantages of the traditional DPCA and ATI approaches, and the e fectiveness of the proposed method is proved through both theoretic analysis and compute simulation.

Keywords： SAR　GMTI (Ground Moving Target Indication)　Time-frequency analysis　MDCFT (Modified Discrete Chirp-Fourier Transformation)　Dechirp

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