

论文

基于邻域平均和正交分解的双通道SAR图像域慢动目标检测方法

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摘要

慢动目标检测是利用合成孔径雷达(Synthetic Aperture Radar, SAR)实现空间对地观测应用的一个主要方面, 具有广泛的应用背景和重要的学术价值。为了构建检测率高、实用性强的双通道SAR地面慢动目标检测过程, 本文提出了一种基于邻域平均和协方差矩阵正交分解的检测算法。该算法在对特征值分解量进行修正的基础上, 通过获取采样协方差矩阵与杂波协方差矩阵正交的分量, 以此构造出有效的动目标检测量, 结合采样协方差矩阵的邻域平均处理, 实现慢动目标的精确检测。相比常规的DPCA(Displaced Phase Center Antenna)技术, 该算法具有杂波抑制能力强、旁瓣抑制能力好、检测门限设定简单、检测率高、虚警率低等特点, 仿真结果证明了该算法的有效性。

关键词

[合成孔径雷达](#) [协方差矩阵](#) [特征值分解](#) [正交分解](#)

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A Novel Ground Moving Target Detector in Dual-channel SAR Images Based on Adjacent Average and Orthogonal Projection

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Abstract

Concerning the detection of ground moving targets in dual-channel SAR images, a novel detector based on adjacent average and orthogonal projection is proposed. According to obtaining the component of the sample covariance matrix energy vector that is perpendicular to the clutter covariance matrix energy vector, then effective metric can be constructed by this orthogonal component. Combining the processing of adjacent average, all of the slow ground moving targets can be exactly detected. Compared with traditional DPCA, this new method can achieve better clutter rejection, eliminate influences from moving targets' sidelobes, set threshold more easily and get lower false alarm probability. The simulated results prove the effectiveness of this metric.

Key words [Synthetic Aperture Radar \(SAR\)](#) [Covariance matrix](#) [Eigen-decomposition](#) [Orthogonal projection](#)

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