

论文

UWB SAR叶簇遮蔽目标中的变化检测技术

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摘要:

在超宽带合成孔径雷达叶簇隐蔽目标检测中, 目前采用的变化检测算法主要包括归一化相减法和似然比法, 这两种算法在实际应用中存在如下问题: 归一化相减法在图像相关性较低时性能下降严重, 而似然比法需要目标及杂波充分的先验知识。鉴于上述问题, 本文提出了一种两级处理变化检测算法, 第一级基于修正的线性均方估计构造变化检测量; 第二级采用一种改进的秩序滤波器, 在保持目标边缘特性的同时, 克服了待检测图像中杂波分布的正向拖尾特性, 提高了算法检测性能。文中最后基于实测数据验证了算法的有效性。

关键词: 超宽带合成孔径雷达; 叶簇隐蔽目标检测; 变化检测; 修正线性最小均方估计

Change Detection in UWB SAR FOPEN Target Detection

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Abstract:

The main change detection algorithms include forming likelihood ratio algorithm and normalized image subtraction algorithm in FOPEN target detection using UWB SAR. There are respective problems for two change detection algorithms: The performance of normalized image subtraction algorithm will greatly degrade, when the correlation of sar images is reduced, and forming likelihood ratio algorithm needs enough prior knowledge. In this paper, a two stage change detection algorithm is proposed. In first stage, a change test statistic is computed based on modified LMSE estimation. In second stage, an improved rank order filter is introduced. It is used to overcome the positive tail of clutter pdf without destroying the edge information of target, which improves the performance of detection. Finally, the experimental results show that an obvious performance improvement on detect can be obtained through the new algorithm.

Keywords: UWB SAR FOPEN change detection modified LMSE estimation

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