

一种基于多标定体融合的超宽带虚拟孔径雷达系统校正方法

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A Calibration Method Based on Fusing Multiple Calibrators for Ultra Wide Band Virtual Aperture Radar System Using Stepped Frequency

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摘要

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摘要 系统校正技术是影响超宽带(Ultra Wide Band, UWB)虚拟孔径雷达(Virtual Aperture Radar, VAR)对浅埋弱小目标穿地探测效果的重要因素,系统的超宽带特性及多通道不一致性使得常规高频窄带雷达基于单一标定体的校正方法不再适用,该文在对系统误差、标定体及地雷电磁特性分析的基础上,提出了多标定体-分频段融合的多通道校正方法,利用多个标定体对不同频段分别校正,该方法有效地校正了系统误差,提高了成像质量,实测数据验证了方法的有效性。

关键词: 虚拟孔径雷达 系统校正 多标定体 频段融合

Abstract: The system calibration is very important for the Ultra Wide Band-Virtual Aperture Radar (UWB-VAR) which could penetrate ground to detect the flush buried targets with weak scattering. The usual system calibration method used in narrow band radar with high frequency is based on one single calibration object, which can not be applied to the UWB-VAR system any more for its ultra bandwidth and inconsistentness among different channels. In this paper after analyzing the system errors and the electromagnetism of both calibration objects and landmines a new method basing on fusing multiple calibrators and multiband is introduced. This new method could not only calibrate the system errors efficiently, but also enhance the performance of imaging. Finally it is proved to be effective by the real data.

Keywords: Virtual Aperture Radar (VAR) System calibration Multiple calibrators Multi-band fusion

Received 2011-04-11;

本文基金:

国家自然科学基金(60972121)和全国优秀博士学位论文作者专项资金(201046)资助课题

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引用本文:

王鹏宇,周智敏,宋千,金添.一种基于多标定体融合的超宽带虚拟孔径雷达系统校正方法[J] 电子与信息学报,2011,V33(11): 2775-2779

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链接本文:

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2011.00337> 或 <http://jeit.ie.ac.cn/CN/Y2011/V33/I11/2775>

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