

论文

车载前视地表穿透SAR多视处理中的关键技术研究

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摘要

地表穿透合成孔径雷达(GPSAR)工作在低频区, 具有地表穿透获得浅埋目标二维高分辨图像的能力。利用车载前视GPSAR可以在前进过程中对前方地雷和雷场进行远距离快速探测, 是探雷的发展趋势。由于相干斑噪声会影响目标检测, 该文研究了适合车载前视GPSAR的多视处理, 提出了地距平面聚焦BP算法和地距平面图像折射和色散影响校正方法。提出的方法能解决多视处理中图像配准和浅埋目标二层介质成像问题。通用Rail-GPSAR实测数据对车载系统实际工作情况的模拟, 验证了该文提出的方法能有效提高图像的等效视数和辐射分辨率。

关键词 [合成孔径雷达](#) [地表穿透](#) [多视](#) [折射和色散](#)

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Study of Key Techniques in Multi-look Processing for Vehicle-Borne Forward-Looking Ground Penetrating SAR

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Abstract

Ground Penetrating Synthetic Aperture Radar (GPSAR), working in low frequency, has the capability of ground penetrating to obtain the two-dimensional high-resolution image of shallow buried targets. Vehicle-borne forward-looking GPSAR can detect landmines and minefields in front from a standoff distance quickly, which is a trend of landmine detection. Because speckle noise will influence target detection, the multi-look processing is studied in this paper and ground plane focusing BP algorithm and refraction and dispersion effects correction techniques are proposed. The proposed methods can solve the problems of images registration and shallow buried target two-layered medium imaging in multi-look processing. The proposed methods can improve the image Equivalent Number of Looks (ENL) and Radiometric Resolution (RR) efficiently, which is proved by the practical operating condition simulation of vehicle-borne system with the field data collected by the Rail-GPSAR system.

Key words [Synthetic Aperture Radar \(SAR\)](#) [Ground penetrating](#) [Multi-look](#) [Refraction and dispersion](#)

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