

2592513

first experiment of iecas p-band quad-pol sar system in circular imaging mode

Hong, Wen

IECAS

Within the framework of the DRAGON project, the Institute of Electronics, Chinese Academy of Sciences (IECAS) continuously had a tight collaboration with the European and the Chinese partners. Joint research is around the 4 working packages: land cover analysis, earth surface deformation monitoring and DEM extraction, forest vertical structure parameters extraction, and PolSARpro software continued development. In the study of theory and methodology, a joint study between IECAS, NKLMIT and University of Rennes-1, Institute of Electronics and Telecommunications, about DEM based soil moisture inversion using POLSAR data is reviewed. Besides, by incorporating a fully polarimetric distortion model, a compact-pol calibration algorithm for a wide-band ground-based SAR system can be used in both $\pi/4$ and CL mode is involved. Finally, a supervised land cover classification method based on polarimetric SAR feature parameters and Fisher Linear Discriminant is proposed. In the experimental data acquirement and processing, the first experiment of IECAS P-band quad-pol SAR system in circular imaging mode, and the according analysis of polarimetric SAR processing are presented. The detailed working list is in the following. The first experiment of IECAS P-band quad-pol SAR system in circular imaging mode was carried out in August 2011. Circular Synthetic Aperture Radar (CSAR) has the capability of 360° all-aspect observation and high resolution 3-D reconstruction and holds interesting target signature. Accordingly, the processing techniques aiming at estimating elevation information based on circular SAR is introduced, and the quad-pol CSAR images of special targets are illustrated.

Dragon project id

11 POLINSAR (ID. 5344)

P波段全极化SAR系统圆周轨迹成像模式实验

洪文

中国科学院电子学研究所，微波成像技术国家重点实验室 whong@mail.ie.ac.cn

在"龙计划"的工作框架下，中国科学院电子学研究所（IECAS）与项目的欧方成员和中方成员持续地保持着紧密的合作关系。具体地，在陆地覆盖分析、地表形变监测与数字高程模型提取、森林垂直结构参数提取、以及PolSARpro软件持续开发四个方面开展了合作研究。

在理论方法研究方面，首先介绍了基于DEM坡度的极化SAR数据土壤湿度反演研究工作。该研究是基于本项目的合作，由中国科学院电子学研究所，微波成像技术国家重点实验室与项目的欧方成员：法国雷恩第一大学（University of Rennes 1 in France），雷恩电子电信研究所共同开展的。此外，本报告还将介绍基于全极化系统误差模型建立的宽带地基SAR系统简缩极化（compact-pol）定标算法，该算法可应用于 $\pi/4$ 模式和CL模式。最后，报告将介绍一种基于极化SAR特征参数及Fisher线性判别法的极化SAR地物监督分类方法。

在实验数据获取和处理方面，介绍了首次开展的IECAS P波段极化SAR圆周轨迹成像实验，和极化SAR数据应用处理研究。具体的研究成果列表如下：

2011年8月首次开展了IECAS P波段极化SAR圆周轨迹成像实验。圆迹合成孔径雷达（Circular SAR，CSAR）具有 360° 全方位多角度观测能力和高分辨三维重建能力并包含了独特的观测对象特征信息。在此基础上，提出了一种在CSAR模式下直接获取目标场景区域高程信息的方法并展示了极化CSAR图像中典型观测对象的特征。