

一种机载双天线InSAR基线动态测量方法

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The Dynamic Measurement for the Baseline of Airborne Dual-antenna InSAR

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摘要 机载双天线InSAR系统两个天线非刚性连接时, 为保证高程测量精度和成像质量, 必须对干涉基线进行动态精密的测量。该文研究了一种基于单相机和激光测距仪组合的动态基线测量方法, 通过分别测量两个天线的中心位置和姿态, 得到干涉基线长度和基线角。论文对该方法进行了原理性研究和地面验证实验, 实验通过可精确控制轨迹的运动平台模拟天线运动, 实验结果表明该方法在8 m摄影距离处位置测量精度优于0.2 mm, 姿态角精度优于70", 是动态测量干涉基线的有效方法。

关键词: 干涉合成孔径雷达 基线测量 近景摄影测量 单像空间后方交会

Abstract: In this paper, a method for dynamic measurement of non-rigid baseline of dual-antenna InSAR is presented and discussed. In this scheme, the position and orientation of the antenna is obtained by using a CCD camera and a laser range finder together. In this paper, the research of principle and experiments are carried out. In the experiments, the movement of the antenna is created by some equipments, the tracks of which can be controlled accurately. The results of experiments show that the errors of position and attitude are less than 0.2mm and 70 arcseconds. The method is applicable to determine the baseline of dual-antenna dynamically.

Keywords: InSAR Baseline measurement Close range photogrammetry Single image space resection

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