

一种基于连接点的机载InSAR区域网DEM重建方法

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A Method for Airborne InSAR Block DEM Generation Based on Tie Points

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摘要

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摘要 基于干涉合成孔径雷达(Interferometric SAR, InSAR)技术生成高精度数字高程模型(Digital Elevation Model, DEM), 需要进行干涉标定。繁重的地面控制点(Ground Control Points, GCPs)布放不利于InSAR大区域地形测绘的自动化。该文介绍一种稀疏GCPs下, 基于自动提取的连接点(Tie Points, TPs), 利用最小二乘平差原理, 实现InSAR区域网内多景相互重叠DEM的同时重建方法。通过改变参与重建的TPs数目, 用X波段InSAR实测数据的实验验证了该文方法的有效性。

关键词: InSAR区域网 地形测绘 连接点 最小二乘 数字高程模型

Abstract: The high accurate Digital Elevation Model (DEM) generated by InSAR (Interferometric Synthetic Aperture Radar) relies on the interferometric calibration. However, the requirement of sufficient Ground Control Points (GCPs) is time consuming and impractical for the cartographic surveying by InSAR over large areas. This paper describes how to implement the interferometric calibration when few GCPs are available. First, the tie points are automatically detected between the adjacent scenes, and then the mathematical model of combined block adjustment among multi-strips and multi-scenes is deduced. Then based on this model, experimental results on the X-band InSAR data validate effectiveness of the presented method.

Keywords: Interferometric SAR (InSAR) block Cartographic surveying Tie Points (TPs) Least squares Digital Elevation Model (DEM)

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