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论文

机载差分干涉SAR的误差分析

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摘要
该文就机载差分干涉中影响精度的几个重要因素进行了详细的分析，为开展机载差分干涉应用提供理论基础。首先考虑机载差分干涉算法流程中引入的误差，指出必须利用外部DEM(Digital Elevation Model)计算本地视角才能实现高精度的形变反演。随后，重点讨论了影响差分干涉SAR (Synthetic Aperture Radar) 的几个重要影响因素：系统参数误差、相干性和大气效应。系统参数中基线和基线角的误差对差分干涉的精度影响最大，由此对机载残余运动的补偿提出了很高的要求。相干性分析又对机载差分干涉中形变像对的基线长度提出了严格的限制条件。和星载SAR一样，机载SAR同样受到大气的影响。通过计算这些因素的对机载差分干涉精度的影响，给出了机载差分干涉精度的表达式。

关键词 机载SAR差分干涉 精度 大气效应 相干性

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Error Analysis for Airborne Differential SAR Interferometry

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Abstract
This paper mainly analyzes the important factors that influence the accuracy of airborne differential SAR interferometry. The error induced by the processing procedure of differential SAR interferometry is first considered, and it is point out that external DEM is indispensable to achieve high accuracy in detecting and monitoring deformations of the earth's surface. Then several factors, i.e. system parameters, coherence and atmosphere, are discussed in detail. Among these factors, baseline length and orientation play a much more crucial role, and that means high quality of motion compensations are necessary. By connecting the coherence with the accuracy of airborne SAR differential interferometry, the flight path for repeat-pass interferomtery have to be precisely controlled to meet the baseline requirement. Similar to spaceborne SAR, Airborne SAR also suffers atmosphere effect. After discussing all these factors, the mathematical expressions of the accuracy are presented for airborne differential SAR interferometry.

Key words Airborne differential SAR interferometry Accuracy Atmosphere effect Coherence

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