

技术方法

InSAR平地相位去除算法及其对DEM精度影响研究

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摘要:

准确有效去除干涉纹图中的平地相位是精确重建DEM的关键。探讨了两类常见的去平地相位方法(基于地理定位和基于干涉频谱), 分析了其所引起的误差影响。通过Envisat和JERS-1两种数据的验证结果表明: 在可获取精密轨道数据的情况下, 基于地理定位的去平方法能够有效去除干涉纹图中所包含的平地相位, 并很好地控制最终所得的DEM误差, 其效果优于基于干涉频谱的去平方法; 基于干涉频谱的去平方法在干涉频谱平均空间频率为0时, 所引起的DEM误差相对较小; 在精密轨道数据缺乏的情况下, 两种方法均不能满足重建DEM精度要求。

关键词: 雷达干涉 平地相位 轨道数据 干涉频谱 高程误差

AN ANALYSIS OF DIFFERENT INSAR FLATTENING ALGORITHMS AND THEIR INFLUENCE ON DEM ACCURACY

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Abstract:

In the interferometric SAR (InSAR) processing, the interferogram flattening is a key procedure for eliminating the flat-earth phase and decreasing the density of fringes. In this paper, two different techniques for flattening, using respectively the orbit data and the interferogram spectrum, are analyzed. Various error sources, their comparisons and especially their influence on final DEM accuracy are discussed in detail. According to the sample data experiment, several conclusions can be drawn: the flattening algorithm based on geometry parameters with precise orbit data can remove the flat earth phase accurately and constrain the DEM error to a low level, which is obviously better than that based on interferogram spectrum. When the mean spatial frequency of the interferogram spectrum is equal to zero, relatively low DEM error will be retrieved with the flattening algorithm based on interferogram spectrum. However, if precise orbit data cannot be obtained, DEM reconstruction can't meet high accuracy requirement with the flattening algorithm based on geometry parameters or interferogram spectrum.

Keywords: InSAR Flat-earth phase Orbit data Interferometric spectrum Height elevation error

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2. 徐佳, 关泽群, 何秀凤. 重复轨道雷达干涉测量中的大气影响及其研究展望[J]. 国土资源遥感, 2007,18(2): 1-5
3. 倪文俭, 过志峰, 孙国清. 基于PALSAR数据的DEM提取方法研究[J]. 国土资源遥感, 2009,20(3): 19-23

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