

论文与技术报告

欺骗干扰对INSAR复图像配准的影响分析

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摘要:

干涉式合成孔径雷达 (INSAR) 利用SAR图像对获得观测区域的高程信息, 其准确性与SAR图像对的相关性有着密切的联系。受到干扰的SAR图像对间相关性会发生变化, 这将直接影响INSAR的成像处理结果。该文首先阐述了间歇采样转发干扰、弹射式干扰的原理, 分析了其对主辅天线回波信号相位的影响; 接着计算机仿真了两种干扰条件下的复图像对配准情况; 然后通过配准相关系数特性及干涉相位图质量分析了两种干扰方式对INSAR复图像对配准的影响, 结论如下: 间歇采样转发干扰能够破坏复图像对的相关性; 弹射式干扰条件下, SAR图像对仍能保持较高的相干性, 但SAR图像对配准后形成的干涉相位图所代表的地形与真实地形存在较大差异, 即与间歇采样转发干扰相比, 弹射式干扰对InSAR具有更强的欺骗效果。

关键词: 干涉式合成孔径雷达; 间歇采样转发干扰; 弹射式干扰; 相关系数; 干涉相位图

Analysis on the effects of deceived jamming on the co-registration of INSAR imaging

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Abstract:

Interferometric Synthetic Aperture Radar (INSAR) altimetry technique is using a pair of SAR images to obtain the elevation information of the observation region. Its accuracy is closely linked to the correlation between the SAR images. The correlation between the disturbed SAR images will be changed, which will directly affect the InSAR imaging results. Firstly, the paper has described the principle of the interrupted sampling repeater jamming and the rebound jamming and then, the effects of the jamming on the echo phase of the master and the slave antennas are researched. Secondly, it has simulated co-registration processing between a pair of complex SAR images under the different deception jamming conditions. Then the effects of the deception jamming on the co-registration processing are analyzed according to the characteristics of the correlation coefficient and the quality of the interference pattern. Last, The paper has concluded that the interrupted-sampling jamming can make the correlation between the SAR images worse, and the SAR images maintain the high coherence under the rebound jamming but the elevation information represented by the new interference pattern is very different from the real one, that is to say, compared with the interrupted-sampling repeater jamming, the rebound jamming has more deception effects on the InSAR.

Keywords: Interferometric Synthetic Aperture Radar interrupted sampling repeater jamming rebound jamming correlation coefficient the interference pattern

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