电子与信息学报
JOURNAL OF ELECTRONICS & INFORMATION TECHNOLOGY

电子与信息学报 » 2011, Vol. 33 » Issue (11) :2709-2713 DOI: 10.3724/SP.J.1146.2011.00111

通道一致性误差对InSAR性能的影响分析

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Analysis of Channel Mismatch Error on InSAR Performance

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摘要 雷达设备收发分置带来的通道幅相一致性误差是单航过InSAR系统必须考虑的突出问题之一。该文建立了通道间幅度和相位一致性误差模型，采用面目标统计信号模型得到幅相误差存在时相干系数的计算结果，分析了通道一致性误差对InSAR干涉相位偏差和标准差的影响。最后利用地面半实物仿真试验得到实际雷达通道一致性误差引入的干涉测高误差，半实物试验结果与理论分析一致，验证了通道一致性误差影响分析的正确性。

关键词： 干涉SAR 通道一致性误差 性能分析 半实物仿真

Abstract： The channel mismatch error between separate radar instruments is one of the challenges in the single pass Interferometric SAR (InSAR) system. A channel amplitude and phase mismatch error model is introduced. The correlation coefficient with the channel mismatch error is obtained by a statistical signal model of extended scene. The influence of channel mismatch error on the InSAR phase deviation and variance is analyzed. Finally, a ground-based hardware-in-loop simulation is carried out to study the actual radar channel mismatch error impact on the InSAR performance. The simulation results are concordant with the theoretical analysis, which validate the correctness of the influence analysis of the channel mismatch error.

Keywords： InSAR Channel mismatch error Performance analysis Hardware-in-loop simulation

Received 2011-02-14;

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引用本文:

何志华, 何峰, 黄海风, 梁甸农.通道一致性误差对InSAR性能的影响分析[J] 电子与信息学报, 2011,V33(11): 2709-2713

He Zhi-Hua, He Feng, Huang Hai-Feng, Liang Dian-Nong.Analysis of Channel Mismatch Error on InSAR Performance[J] , 2011,V33(11): 2709-2713

链接本文:

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