

应用

双站SAR时频同步技术

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摘要:

基于星载SAR照射源的双站SAR系统, 由于收、发系统分置, 时间同步和频率同步误差会对成像结果造成影响, 甚至不能成像, 因此, 时频同步问题是这类系统需要解决的关键问题之一。本文首先以基于星载辐射源、接收机固定在地面的双站SAR系统为例, 详细分析了时频同步误差的模型, 随后提出了一种利用直达波信号脉压峰值位置和相位信息提取时频同步误差, 实现系统时频同步的方法, 并对该方法的估计精度进行了分析。最后, 通过仿真, 对时频同步方法及其性能进行了验证。根据仿真结果分析, 该方法取得了较好的性能, 可以有效的应用于上述双站SAR系统。

关键词: 双站SAR; 直达波; 时频同步

Time and Frequency Synchronization Technique in Bistatic SAR

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Abstract:

Time and frequency synchronization errors exist in the bistatic SAR based on spaceborne transmitters because the transmitters and receivers are mounted on separated platforms. Time and frequency synchronization error will affect the imaging, even lead to abnormal imaging. Therefore, Time and frequency synchronization is a key problem in this kind of system. Focused on the bistatic fixed-receiver SAR based on spaceborne transmitters, the time and frequency synchronization error model is analyzed firstly, and then, a time and frequency synchronization approach using direct-path echo is presented, in which we obtain the time and frequency error from the peak position and phase of direct-path. Finally, simulations are carried out to prove the validity of the proposed method, and its performance was also examined. Simulation results show that the approach achieves excellent performance, and can be applied effectively in the above-mentioned bistatic SAR systems.

Keywords: Bistatic SAR; Direct-path echo; Time and Frequency Synchronization

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