

基于方位deramp和NFS大斜视聚束SAR成像算法

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Imaging Algorithm of High Squint Spotlight SAR Based on Azimuth Deramp and Nonlinear Frequency Scaling(NFS)

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摘要

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摘要 该文针对聚束SAR回波信号方位向频谱混叠和大斜视时距离向和方位的严重耦合,提出了一种结合方位向deramp和非线性频率变标(NFS)的斜视聚束SAR成像算法。首先在方位向进行deramp操作,消除方位频谱混叠。然后通过非线性频率变标并考虑距离向时频变换的标度变化补偿方位相位,实现场景成像。仿真结果表明,该算法可有效消除方位频谱混叠,具有较高的精度,满足大斜视聚束SAR的成像要求和较大测绘带宽度要求。

关键词: 聚束合成孔径雷达 方位deramp 非线性频率变标 大斜视

Abstract: To eliminate the azimuthal spectral folding of spotlight Synthetic Aperture Radar (SAR) and the serious coupling between range and azimuth in high squint mode, an algorithm based on azimuth deramp and Nonlinear Frequency Scaling (NFS) is proposed. First, azimuth deramp operation eliminates the azimuthal spectral folding. Then nonlinear frequency scaling compensating the azimuth phase with the range scale variation is adopted to fulfill the focusing of the swath. Simulation results illustrate that it can eliminate azimuthal spectral folding, possess high precision and satisfy the imaging quality of high squint spotlight SAR and large scene swath.

Keywords: Spotlight SAR Azimuth deramp Nonlinear Frequency Scaling (NFS) High squint

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