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短文与研究通讯

任意构型双基地SAR二维频谱精度定量评估研究

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摘要：

双基地SAR频域成像算法，是目前SAR成像领域的研究热点。由于双基地SAR的距离历史具有双根号形式，利用驻定相位原理无法得到解析的二维频谱表达式，这给双基地SAR频域成像算法的研究带来了一定困难。本文通过引入点目标冲激响应，利用主瓣宽度、峰值旁瓣比和积分旁瓣比三个指标对扩展LBF、级数反演、二维驻定相位原理得到的点目标冲激响应进行了量化评估。同时，以星机双基地SAR成像为例，仿真不同频谱模型的二维聚焦效果，进一步验证了不同频谱模型的精度。

关键词： 双基地SAR;二维频谱;扩展LBF;级数反演;二维驻定相位原理

Achieving Quantitative Evaluation of Two-Dimensional Spectrum Precision for Bistatic SAR with General Configurations

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Abstract:

The imaging algorithms in frequency domain of bistatic synthetic aperture radar (SAR) are a hot topic in the field of SAR imaging at present. Because the range history of bistatic SAR has the form of double-square-root, the analytic two-dimensional spectrum express can not be deduced using the principle of stationary, which brings a certain difficulty to research on imaging algorithms of frequency domain. The impulse response of a point target is introduced, and the main-lobe width, peak side-lobe ratio and integrated side-lobe ratio are utilized to perform quantitative evaluation of point target’s impulse response obtained by extended LBF (ELBF), method of series reversion (MSR) and two-dimensional principle of stationary phase (2D PSP) respectively. Meanwhile, taking spaceborne/airborne hybrid bistatic SAR imaging for example, two-dimensional focused results using different spectrum model is processed, which furtherly validates the precision of three kinds of spectrum model.

Keywords: Bistatic synthetic aperture radar two-dimensional spectrum extended Loffeld’s bistatic formula method of series reversion two-dimensional principle of stationary phase

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