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扫描SAR全孔径成像处理方法

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A Full-aperture Imaging Method for ScanSAR

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摘要 该文提出了一种新的扫描SAR全孔径成像处理方法。首先根据谱分析(SPECAN)方法进行方位预滤波得到无模糊的二维频谱，在此基础上利用传统的非线性CS方法完成距离压缩及距离徙动校正，然后结合Dechirp思想将信号聚焦在频率域，最后通过Chirp-Z变换实现几何形变校正。该算法不需要插值操作和坐标转换，因此运算量小，效率高。仿真和实测数据处理结果验证了算法的有效性。

关键词： 扫描SAR 全孔径处理 谱分析 Chirp-Z变换

Abstract： This paper proposes a new full-aperture imaging algorithm for ScanSAR. Firstly, the two dimensional (2-D) spectrum is obtained by the azimuth pro-filtering which adopts the idea of SPECAN. Then the Nonlinear Chirp Scaling (NCS) method is used to complete the range compression and Range Cell Migration Correction (RCMC). After that, the signal is focused in the Doppler domain by dechirping operation. Finally, geometric distortion correction is carried out via a Chirp-Z Transform (CZT). Without interpolation and coordinate transformation, the algorithm is high in computational efficiency. Both simulation and results of real data are provided to demonstrate the effectiveness of the proposed method.

Keywords： ScanSAR Full-aperture processing SPECAN Chirp-Z transform (CZT)

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