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论文

采用方位向自适应滤波器提高SAR自聚焦的性能

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摘要
机载合成孔径雷达的方位向降采样经常会降低原始图像的信噪比。自动聚焦是从雷达回波信号中提取多普勒参数，以获得高分辨率SAR图像。该文分析了信噪比对自聚焦的影响，提出利用自适应滤波器来做方位向预滤波和降采样，在降低采样率的同时，保持原始图像的信噪比，再经有效的自动聚焦算法，得到较准确的多普勒参数估计值，从而获取高分辨率SAR图像。通过对实际SAR回波数据的处理，证明了采用自适应滤波器后，图像信噪比能比采用普通滤波器时有较大提高，从而显著改善自动聚焦的收敛性，提高成像质量。

关键词 自适应滤波器 信噪比 自动聚焦

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To improve the performance of autofocus in SAR images with an azimuth adaptive filter

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Abstract
In SAR azimuth signal processing, it is very common to subsample the raw data with a filter, which may reduce the Signal Noise Ratio(SNR) of the raw image. Since autofocus is to estimate the Doppler parameters from the raw data, with the reduced SNR, the result of autofocus may be incorrect. And images processed with the incorrect parameters will be worsened. This paper analyses the effect of SNR on autofocus and proposes an adaptive filter in SAR azimuth subsampling to keep SNR as high as possible, so that the performance of autofocus can be improved and higher image quality achieved. Finally, an image processed with the adaptive filter is contrasted with the result of a traditional filter, which proves the effectiveness of the adaptive filter on autofocus and the final image.

Key words Adaptive filter Signal Noise Ratio（SNR） Autofocus

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