电子与信息学报 2010 32 (5): 1234-1238 ISSN: 1009-5896 CN: 11-4494/TN

研究简报

基于压缩感知的二维雷达成像算法

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收稿日期 2009-9-15 修回日期 2010-2-9 网络版发布日期 2010-4-26 接受日期

摘要
压缩感知理论能够有效地降低高分辨率雷达成像系统的数据率。该文通过对复基带雷达回波信号模型的稀疏性分析，提出了一种具有保相性的压缩感知距离压缩算法。在此基础上建立了距离向采用压缩感知距离压缩算法，方位向采用传统的雷达成像算法处理的雷达2维成像方案。通过对仿真和实测逆合成孔径雷达数据的成像处理验证了方案的有效性。

关键词 逆合成孔径雷达 雷达成像 压缩感知 距离压缩

分类号 TN957.52

2D Radar Imaging Scheme Based on Compressive Sensing Technique

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Abstract
Compressive sensing technique has been shown to be able to reduce effectively the data rate of high- resolution radar imaging system. A phase-preserving range compression algorithm based on Compressive Sensing (CS) technique is proposed, after analyzing the sparse characteristics of complex base-band echo signal from a target using chirp signal as transmitted signal. Based on this range compression algorithm, a 2D imaging scheme is established, i.e. performing range compression by using CS technique and performing azimuth compression by using traditional technique. The effectiveness of the 2D imaging scheme is tested through processing both simulated data and real radar data.

Key words ISAR Radar imaging Compressive Sensing(CS) Range compression

DOI: 10.3724/SP.J.1146.2009.01223

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