

短文与研究通讯

步进正负调频信号实现MIMO SAR距离高分辨

马喜乐, 董臻, 孙造宇

国防科学技术大学电子科学与工程学院

摘要:

带宽合成技术通过多子带步进调频信号的数据融合实现距离向超高分辨。单相位中心顺序收发模式对系统PRF要求较高,在星载条件下不利于实现高分大测绘带成像。文章对基于多发多收(MIMO)SAR系统的子带并发体制进行研究,详细阐述该体制下子带信号合成的方法,指出带宽合成前必须对相位中心的位置差异进行校正,针对子带串扰带来的虚像问题,首先对其出现机理进行详细分析,最后提出应用步进正负调频信号的方法,在距离压缩后进行子带合成,在实现距离高分辨的同时进一步抑制虚像峰值,仿真结果验证了方法的有效性。

关键词: 合成孔径雷达; 多发多收; 带宽合成; 虚像抑制; 步进正负调频

Generation of High Range Resolution in MIMO SAR via Stepped Frequency up and down Chirp Signal

MA Xi-Le, DONG Zhen, SUN Zao-Yu

School of Electronic Science and Engineering, National University of Defense Technology, Changsha

Abstract:

Synthetic bandwidth technology realizes super range resolution by fusing multi-band stepped chirp signal. The mode that transmitting and receiving sub-band signal in consequence with single phase center imposes strict request on pulse repetition frequency (PRF), which means that this mode is not suit for high resolution wide swath imaging of space-born SAR. This thesis focuses on multiple-input multiple-output (MIMO) SAR based concurrent-sub-band system, interprets the principal of signal processing, points out the indispensability of correction of azimuth positions. Because of the overlap between neighboring sub-band, unwanted virtual image is unavoidable. The mechanism of the virtual image is interpreted in detail, stepped frequency up and down chirp signal based approach is put forward to suppress the peak level of the unwanted profile, the validity of the approach is demonstrated by simulation results.

Keywords: Synthetic Aperture Radar Multiple-input Multiple-output Synthetic Bandwidth Suppression of Virtual Image Stepped Frequency Up-and-Down Chirp

收稿日期 2010-06-02 修回日期 2010-12-29 网络版发布日期 2011-05-25

DOI:

基金项目:

通讯作者:

作者简介:

作者Email: darkbone@126.com

参考文献:

本刊中的类似文章

文章评论

扩展功能

本文信息

- Supporting info
- PDF(1159KB)
- [HTML全文]
- 参考文献[PDF]
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章

- 合成孔径雷达; 多发多收;
- 带宽合成; 虚像抑制; 步进正负调频

本文作者相关文章

- 马喜乐
- 董臻
- 孙造宇

PubMed

- Article by Ma, X. L.
- Article by Dong, Z.
- Article by Sun, Z. Y.

| | | | |
|-------------|----------------------|------|----------------------|
| 反 馈 人 | <input type="text"/> | 邮箱地址 | <input type="text"/> |
|-------------|----------------------|------|----------------------|

反馈标题

验证码

0349