

超宽带穿墙雷达双稳健波束互相关加权的自适应成像方法

晋良念^{*①②} 欧阳缮^② 肖海林^{②*}

^①(西安电子科技大学工程学院 西安 710071) ^②(桂林电子科技大学信息与通信学院 桂林 541004)

Ultrawideband Through-the-wall Radar Adaptive Imaging Approach Using Cross-correlation Weighting of Dual Robust Beamforming

Jin Liang-nian^{①②} Ouyang Shan^② Xiao Hai-ling^{②*}

^①(School of Electronic Engineering, Xidian University, Xi'an 710071, China)

^②(School of Information and Communication, Guilin University of Electronic Technology, Guilin 541004, China)

摘要

参考文献

相关文章

Download: PDF (763KB) [HTML](#) 1KB Export: BibTeX or EndNote (RIS) [Supporting Info](#)

摘要 为了改善超宽带穿墙雷达目标成像质量, 论文提出双稳健波束互相关加权的自适应成像方法。该方法将基阵交替划分为两个子阵, 利用双约束稳健Capon波束形成(DRCB)独立估计子阵波束输出信号, 取其信号和的能量作为像值获得高成像分辨率和强干扰抑制能力; 又因两波束的输出具有非常相似的主瓣响应和不同旁瓣响应的特点, 取其互相关系数加权像值, 可以减小旁瓣达到提高成像对比度的目的。时域有限差分(FDTD)数值仿真和实验数据处理结果验证了该方法的有效性。

关键词: 超宽带穿墙雷达成像 双约束稳健Capon波束形成 互相关系数 分辨率 对比度

Abstract: An effective adaptive imaging method using cross-correlation weight of dual robust beamforming is proposed for UltraWideBand (UWB) through-the-wall imaging radar. Dual constrained Robust Capon Beamformings (DRCB) is applied to these 2 subarrays which get by dividing array alternately. The energy of the sum of these 2 beamformings output signals is regarded as pixel value in order to achieve higher resolution and much better interference suppression capabilities. Because these 2 beamformings have a well-correlated mainlobe response and a different or uncorrelated sidelobe response, the Cross-correlated Coefficient (CC) of two beamformings output signals is weighted for each pixel to suppress sidelobe so as to improve significantly contrast. The excellent performance of the proposed method is demonstrated by FDTD numerical simulations and the experimentally measured data results.

Keywords: UltraWideBand (UWB) through-the-wall radar imaging Dual constrained Robust Capon Beamformings (DRCB) Cross-correlated Coefficient (CC) Resolution Contrast

Received 2010-08-12;

本文基金:

国家自然科学基金(60572054), 教育部留学回国人员基金和广西科学技术研究与技术开发项目(桂科能05112001-7A)资助课题

通讯作者: 晋良念 Email: jinglingling5653@sina.com.cn

引用本文:

晋良念, 欧阳缮, 肖海林. 超宽带穿墙雷达双稳健波束互相关加权的自适应成像方法[J] 电子与信息学报, 2011, V33(7): 1644-1648

Jin Liang-Nian, Ouyang Shan, Xiao Hai-Lin. Ultrawideband Through-the-wall Radar Adaptive Imaging Approach Using Cross-correlation Weighting of Dual Robust Beamforming[J], 2011, V33(7): 1644-1648

链接本文:

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.00843> 或 <http://jeit.ie.ac.cn/CN/Y2011/V33/I7/1644>

Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

作者相关文章

- ▶ [晋良念](#)
- ▶ [欧阳缮](#)
- ▶ [肖海林](#)