

算法研究

斜投影极化滤波的雷达导引头抗箔条干扰方法

来庆福, 赵晶, 冯德军, 王雪松

国防科学技术大学电子科学与工程学院

摘要:

反舰导弹跟踪阶段受到箔条质心干扰, 当箔条云初形成, 舰船目标与箔条干扰处于同一雷达分辨单元, 不可分辨时, 无法通过识别方法进行对抗, 严重影响导弹的作战效能。本文研究了采用斜投影极化滤波技术抑制不可分辨的箔条质心干扰问题。首先建立了不可分辨情况下目标和干扰的极化雷达导引头回波信号模型, 根据目标与干扰的回波幅度概率密度函数, 推导得到质心干扰条件下单脉冲比幅测角体制的角度测量误差概率密度函数, 并对角度测量误差统计特性进行了定量的分析; 接下来在阐明斜投影基本原理的基础上, 提出了基于斜投影极化滤波的抗箔条质心干扰方法; 最后结合典型场景, 通过计算机仿真对本文所提抗箔条质心干扰方法的有效性进行了验证, 并对该抗干扰方法的性能进行了分析。

关键词: 反舰导弹 雷达导引头 质心干扰 斜投影;极化滤波

Anti-chaff Method Based on Oblique Projection Polarization Filtering for Radar Seeker

LAI Qing-Fu, ZHAO Jing, FENG De-Jun, WANG Xue-Song

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

Abstract:

When encountering the chaff centroid jamming (CSJ) during its tracking phase, anti-ship missile can't adopt some recognition approaches to discriminate the target ship from jamming as they fall into the same resolution cell of terminal radar seeker. The application of oblique projection polarization filtering to the rejection of CSJ is discussed. The echoes of target and jamming in polarimetric radar seeker were modeled in the unresolved case, their amplitude probability density function (PDF) were analyzed to derive the angle measuring error PDF of the amplitude comparison monopulse system affected by CSJ, and statistical property of angle error was made. An oblique projection polarization filtering based anti-jamming approach was then introduced on the demonstration of oblique projection principles. Simulation was conducted in a representative scenario to validate the proposed anti-jamming approach, and its anti-jamming performance was also examined.

Keywords: anti-ship missile radar seeker centroid-interference oblique projection;polarization filtering

收稿日期 2011-01-24 修回日期 2011-05-06 网络版发布日期 2011-07-25

DOI:

基金项目:

国家自然科学基金项目(61072119)

通讯作者:

作者简介:

作者Email: laiqingfu@yahoo.com.cn

参考文献:

本刊中的类似文章

1. 刘义, 罗军, 王雪松, 王国玉, 冯德军. 诱偏干扰环境下被动雷达导引头数据灰色处理方法[J]. 信号处理, 2010,26(3): 436-440

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(700KB)
- ▶ [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

- ▶ 反舰导弹
- ▶ 雷达导引头
- ▶ 质心干扰
- ▶ 斜投影;极化滤波

本文作者相关文章

- ▶ 来庆福
- ▶ 赵晶
- ▶ 冯德军
- ▶ 王雪松

PubMed

- ▶ Article by Lai, Q. F.
- ▶ Article by Diao, J.
- ▶ Article by Feng, D. J.
- ▶ Article by Wang, X. S.

反馈人	<input type="text"/>	邮箱地址	<input type="text"/>
反馈标题	<input type="text"/>	验证码	<input type="text" value="7353"/>