论文

海杂波的多重分形关联特性与微弱目标检测

关 键, 刘宁波, 张 建, 宋 杰

海军航空工程学院电子信息工程系 烟台 264001

摘要
该文研究了海杂波的多重分形关联特性及其在海杂波微弱目标检测中的应用。多重分形关联是对多重分形"单点"统计的推广，研究具有不同奇异性强度的两点之间的空间关联特性。该文首先从多重分形理论引出多重分形关联理论，给出了多重分形关联谱的计算方法，然后，以多重分形关联谱为特征进行相似度分析，并把目标检测问题归为一个二元分类问题，采用支持向量机(SVM)进行目标检测。最后，采用不同波段、不同极化方式和不同分辨率条件下的实测海杂波进行验证，结果表明，本文所提方法具有良好的微弱目标检测能力。

关键词　　目标检测　海杂波　多重分形关联　相似度　支持向量机

分类号　　TN959.72

Multifractal Correlation Characteristic of Real Sea Clutter and Low-Observable Targets Detection

Guan Jian, Liu Ning-bo, Zhang Jian, Song Jie

Department of Electronic and Information Engineering,
Navy Aeronautical and Astronautical University, Yantai 264001, China

Abstract
This paper studies the multifractal correlation characteristic of sea clutter and its application to the low-observable target detection within sea clutter. Multifractal correlation, which studies the spatial correlation of two points with different singularity intensity, is a generalization of multifractal 'single point' statistic. First, the paper introduces the multifractal correlation theory and the computation of the multifractal correlation spectrum. Then the multifractal correlation spectrum is used as a character to analyze the similarity degree to match board. In fact, target detection can be regarded as binary-classification, therefore the SVM (Support Vector Machine) is adopted for target detection. Finally, real sea clutter in different bands, polarizations and resolutions is used to verify the method proposed. The results show that the method has good performance of low-observable target detection.

Key words　　Target detection　Sea clutter　Multifractal correlation　Degree of similarity　SVM

通讯作者　刘宁波 lnb198300@yahoo.com.cn

作者个人主页　　关 键; 刘宁波; 张 建; 宋 杰

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