电子与信息学报 2010 32 (1): 98-101 ISSN: 1009-5896 CN: 11-4494/TN

论文

非相干分布源DOA和角度扩展去耦估计方法

张高毅, 唐 斌

电子科技大学电子工程学院 成都 610054

收稿日期 2008-5-30 修回日期 2009-10-26 网络版发布日期 2010-1-12 接受日期

摘要
该文提出了一种新的非相干分布源的DOA和角度扩展估计算法。根据空间频率模型下的非相干分布源协方差矩阵的结构特点，可将协方差矩阵分离成两个分别由相位信息和幅度信息重建的矩阵。对矩阵的各主次对角线元素均进行平滑，可得到包含相位信息和幅度信息的平滑向量。利用最小均方拟合方法，可从相位信息中估计得到方位角；估计得到的方位角信息代入到幅度信息中即可获得角度扩展信息的估计，实现非相干分布源的DOA和角度扩展去耦估计。计算机仿真验证了算法的性能。

关键词 信号处理 非相干分布源 到达方向 角度扩展 去耦估计

分类号 TN911.7

Decoupled Estimation of DOA and Angular Spread for Incoherently Distributed Source

Zhang Gao-yi, Tang Bin

University of Electronic Science and Technology of China, School of Electronic Engineering, Chengdu 610054, China

Abstract
In this paper, a new DOA and angular spread estimation algorithm for incoherently distributed source is proposed. According to covariance matrix's structure character of the spatial frequency model of single incoherently distributed source, the covariance matrix can be separated into two matrixes rebuilt by phase information and amplitude information, respectively. Averaging over the main diagonal and sub-diagonals elements of the matrixes, two averaged vectors containing phase information and amplitude information could be obtained. Using least square fitting, the DOA could be estimated from the phase information, the angular spread could be estimated by substituting the estimated DOA into the amplitude information, and thus the decoupled estimation of DOA and angular spread are realized for incoherently distributed source. Numerical examples illustrate the performance of the method.

Key words Signal processing Incoherently distributed source DOA Angular spread Decoupled estimation

DOI: 10.3724/SP.J.1146.2008.00661

通讯作者 张高毅 gaoyzhang@163.com

作者个人主页 张高毅; 唐 斌