

基于四阶累积量的近远场源多参数联合估计算法

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Joint Multi-parameters Estimation of Near-field and Far-field Sources Based on the Fourth Order Cumulant

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摘要

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摘要 该文提出了一种新的基于四阶累积量的信源多参数联合估计方法, 可实现信源频率、方位及距离的联合估计。该算法无需峰值搜索, 适用于任意高斯噪声环境, 可有效降低阵列孔径损失。算法中, 通过选取特定序号阵元上的输出构造四阶累积量矩阵, 有效地避免了因同时存在远场源时出现的矩阵降秩现象, 因而该算法适用于近场、远场或混合信源的参数估计。仿真结果验证了提出方法的有效性。

关键词: 信号处理 信源定位 近场源 远场源 四阶累积量

Abstract: A new algorithm for jointly estimating multi-parameters (the frequency, Direction Of Arrival (DOA) and range) of sources is proposed. The proposed algorithm does not require spectral peak search, and can be applied to arbitrary Gaussian noise environment. It can reduce the aperture loss. Moreover, the fourth order cumulant matrices are constructed using the special sensor outputs, and the rank reduction of matrices can be avoided when the far-field sources impinging on an array of sensors. So the proposed algorithm can be used to estimate the parameters of near-field, far-field and mixed sources. The performance of the proposed method is validated by simulations.

Keywords: Signal processing Source localization Near-field Far-field Fourth order cumulant

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