

研究简报

脉冲噪声环境下基于分数低阶循环相关的MUSIC算法

吴华佳^①, 赵晓鸥^①, 邱天爽^①, 查代奉^②

^①大连理工大学电子与信息工程学院 大连 116024; ^②九江学院电子工程学院 九江 332005

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摘要

该文以稳定分布作为噪声模型,研究了脉冲噪声环境下循环平稳信号的波达方向估计问题。针对在脉冲噪声环境中基于传统2阶循环相关的算法效果显著退化的问题,该文提出了基于分数低阶循环相关的分数低阶循环MUSIC算法(FLOCC-MUSIC)。将分数低阶循环相关与MUSIC算法相结合,可以有效抑制脉冲噪声的同频带干扰。计算机仿真表明了此算法可有效完成高斯噪声和脉冲噪声条件下的波达方向估计,其性能优于传统的基于2阶循环相关的Cyclic-MUSIC。

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A MUSIC Algorithm Based on the Fractional Lower Order Cyclic Correlation in Impulsive Noise Environment

Wu Hua-jia^①, Zhao Xiao-ou^①, Qiu Tian-shuang^①, Zha Dai-feng^②

^①School of Electronic and Information Engineering, Dalian University of Technology, Dalian 116024, China; ^②School of Electronic Engineering, Jiujiang University, Jiujiang 332005, China

Abstract

This paper takes the α -stable distribution as the noise model and works on the Direction of Arrival (DOA) estimation problem of the cyclostationary signals in the impulsive-noise environment. Since the conventional algorithms based on the classical second order cyclic statistics degenerate severely in the impulsive-noise environment, this paper adopts the fractional lower order cyclic correlation and presents a new algorithm called fractional lower order cyclic MUSIC(FLOCC-MUSIC). It combines the fractional lower order cyclic correlation and MUSIC algorithm, for suppressing the impulse noise and interference in the same frequency band. Simulation results show that the proposed algorithm can give accurate DOA estimation under both Gaussian and impulsive-noise conditions, and its performance is superior to the Cyclic-MUSIC based on second order cyclic correlation.

Key words [Signal processing](#) [DOA estimation](#) [Cyclic stable](#) [\$\alpha\$ -stable distribution](#) [Fractional lower order cyclic statistics](#) [Cyclic-MUSIC algorithm](#)

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通讯作者 邱天爽

作者个人主页 吴华佳^①; 赵晓鸥^①; 邱天爽^①; 查代奉^②

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