

## 空间色噪声环境下基于时空结构的双基地MIMO雷达角度和多普勒频率联合估计方法

符渭波\* 苏涛 赵永波 何学辉\*

西安电子科技大学雷达信号处理国家重点实验室 西安 710071

### Joint Estimation of Angle and Doppler Frequency for Bistatic MIMO Radar in Spatial Colored Noise Based on Temporal-spatial Structure

Fu Wei-bo Su Tao Zhao Yong-bo He Xue-hui\*

National Key Lab for Radar Signal Processing, Xidian University, Xi'an 710071, China

摘要

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**摘要** 该文针对空间色噪声环境提出一种基于时空结构的双基地MIMO雷达角度和多普勒频率联合估计方法,并推导了基于时空结构时角度和多普勒频率估计的克拉美-罗界(CRB)。该方法在时域噪声为高斯白噪声的假设下,首先将不同时刻匹配滤波器输出进行互相关以消除空间色噪声的影响,然后将相邻时刻匹配滤波器输出的时间相位差作为时间旋转因子,采用ESPRIT方法估计目标的DOD(Direction Of Departure), DOA (Direction Of Arrival)和多普勒频率。该方法能够克服空间色噪声的影响,所估计参数自动配对且无阵列孔径损失,并且适用于发射和接收阵列不满足平移不变结构的情况。计算机仿真验证了该文所提方法的有效性。

**关键词:** 双基地MIMO雷达 空间色噪声 时空结构 ESPRIT

**Abstract:** A method of joint estimation of angle and Doppler frequency for bistatic MIMO radar in spatial colored noise based on temporal-spatial structure is presented. In this method, based on the assumption of temporally Gaussian white noise, the cross-correlation of the match filter outputs in different time delay sampling is used to eliminate the spatial colored noise. Then, Direction Of Departure (DOD), Direction Of Arrival (DOA) and Doppler frequencies of the targets are estimated employing ESPRIT using the rotational factor produced by adjacent outputs of match filters in the time domain. This method can eliminate the effect of the spatial colored noise and pair the parameters automatically without array aperture loss, and is applicable to sensor arrays without an invariance structure. Numerical results verify the effectiveness of the proposed method.

**Keywords:** Bistatic MIMO radar Spatial colored noise Temporal-spatial structure ESPRIT

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**通讯作者:** 符渭波 Email: fweibo@gmail.com

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