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运动声阵列自适应交互多模型无迹粒子滤波(PDF)

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Title: Adaptive Interacting Multiple Model Unscented Particle Filter for Dynamic Acoustic Array

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关键词: [运动声阵列](#); [自适应算法](#); [无迹粒子滤波](#); [机动目标跟踪](#); [测量残差](#)

Keywords: [dynamic acoustic array](#); [adaptive algorithm](#); [unscented particle filter](#); [maneuvering target tracking](#); [measured residual](#)

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摘要: 为了提高三维运动声阵列在有色噪声环境中对二维机动目标的跟踪精度, 提出了一种基于测量残差的自适应交互多模型无迹粒子滤波算法。该算法建立了三维运动声阵列跟踪系统动态模型, 通过无迹变换(unscented transformation, UT)构造初始粒子概率分布函数, 利用测量残差及自适应因子实时修正测量协方差和状态协方差; 通过不同算法仿真对比, 验证了文中算法在跟踪精度、稳定性及实时性上的有效性。

Abstract: In order to improve the tracking accuracy of 3D dynamic acoustic array for 2D maneuvering target in colored noise environment, the adaptive interacting multiple model unscented particle filter algorithm based on measured residual was proposed. The 3D motion acoustic array tracking system dynamic model was established, and initial probability density function was also defined based on unscented transformation, after that, the measured covariance and state covariance were online adjusted by measured residual and adaptive factor. Finally, the Matlab simulation results between different algorithms show the validity and superiority of the presented algorithm in tracking accuracy, stability and real time capability.

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