

论文

一种微型飞行器时空调制OFDM通信与跟踪系统

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摘要

为了解决微型飞行器在特殊环境下的通信跟踪和多模导航定位问题, 该文提出了一种新型的微型飞行器通信跟踪与辅助导航定位综合方案, 其核心思想是在发射端发射一种载有空间方位信息的OFDM时空调制信号, 以解决通信与二维测向跟踪问题。系统发射端采用八天线阵列, 两天线一组发射OFDM信号, 每个OFDM信号子载波中包含数字通信信息和空间方位信息, 微型飞行器通过简单的单天线接收信号和多值分辨算法, 解算出二维空间信息, 实现高精度测向定位。文中给出了天线阵的结构, 时空调制OFDM信号的设计, 仰角方位角粗测和精测算法。并仿真了高斯信道下的二维空间信息的测向性能。

关键词 [微型飞行器](#); [测向](#); [时空调制](#); [OFDM](#); [多天线发射](#)

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A System Integrated of Communication and Direction-finding with Space-time OFDM Modulation for Micro Aerial Vehicle

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Abstract

To solve the direction-finding and communication of the micro aerial vehicle in peculiar environment, a new communication and tracking system is proposed. The main idea of this system is that the space-time OFDM signal carrying spatial information is transmitted. The transmitter adopts eight element antennas in this system, which are divided into four arrays to produce multi-beams. There are spatial information and communication message in the signal space of each OFDM subcarrier. The micro aerial vehicle with single antenna could determine the ambiguity resolution of multi-beams with many observed samples to estimate the precision direction of receiver relative to transmitter. This paper presents the geometry of antenna arrays, the space-time signal feeding antenna and the direction-finding algorithm of azimuth and elevation. The performances of bit error rate and direction-finding in the two-dimensional space through Gaussian channel are investigated.

Key words [Micro aerial vehicle](#) [Direction-finding](#) [Space-time modulation](#) [OFDM](#) [Multi-antenna](#)

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