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一种抗频偏的时间精同步方法及性能分析

王 磊*   徐大专*

南京航空航天大学信息科学与技术学院 南京 210016

An Anti Frequency Offset Fine Time Synchronization Method and Its Performance Analysis

Wang Lei   Xu Da-zhuan*

School of Information Science and Technology, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, China

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摘要 该文导出了互相关时间精同步的性能随频率偏移和信噪比变化的表达式，并提出一种受频偏影响较小的精同步方法。该文对同步性能表达式进行分析，得到在某一频偏下同步序列长度的上限值。新方法将同步序列分段，每段和接收信号分别作互相关，将各段的相关值延时相加作为同步的度量。通过仿真将新方法和其它时间同步方法进行了对比。仿真结果表明，新方法可以大大提高系统抗频偏的能力。

关键词： 无线通信 时间同步 互相关 频率偏移

Abstract： This paper analyzes the performance of fine time synchronization which using cross correlation method and gives the relationship between its performance and the parameters of carrier frequency offset and signal to noise ratio. Then this paper proposal a new fine time synchronization method which is less affected by frequency offset. This paper gives the upper limit for synchronization sequence length in a certain frequency offset. In new method, synchronization sequence is split into several parts and correlates with receive signal separately. The delayed correlation values for every segment are added to get the synchronization metric. The simulation results demonstrate that the performance of the new method is robust against frequency offset.

Keywords： Wireless communication Time synchronization Cross-correlation Frequency offset

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