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AOS自适应帧长传输算法研究

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Research on Transmission Arithmetic of AOS Adaptive Frame Length System

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摘要

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摘要 以自适应帧长传输的高级在轨系统(AOS)为对象,从提高系统吞吐量出发,对包信道复用、虚拟信道(VC)复用及帧同步技术进行研究并提出相关的算法。包信道和VC复用算法可有效解决传统固定长度帧的生成与传输问题,降低复用时延,提高复用效率;帧同步算法则解决已有算法受帧长度标识码影响较严重的问题,提升帧同步性能和数据处理可靠性。在分析、推导并仿真各算法性能公式和参数的基础上,对系统吞吐量性能进行仿真比较。结果表明,新算法能够很好地适应AOS自适应帧长系统,保证系统高吞吐量性能。

关键词: 自适应系统 多路复用 同步 Poisson过程 Z变换

Abstract: The purpose of adaptive frame length transmission for an advanced orbiting system (AOS) is improving its throughput. With this in view, a series of specific arithmetic is proposed, such as the arithmetic for packet channel multiplexing, for virtual channel (VC) multiplexing and for frame synchronization. The arithmetic of packet channel and VC multiplexing purposes to meet the needs for generating and transmitting adaptive length frames, reduce delay time, and improve multiplexing efficiency. The frame synchronization arithmetic is to avoid the bit error influence of frame length markers, enhance the probability of frame synchronization and improve the reliability of data processing. The performance formulas of the new arithmetic are given and analyzed to obtain the relevant parameters used in the simulation of the throughput performance, which shows that the proposed arithmetic is suitable for AOS adaptive frame length systems and it can effectively ensure outstanding system throughput.

Keywords: adaptive system multiplexing synchronization Poisson process Z transform

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