

博士论坛

LEO/HEO/GEO三层卫星网络层间ISL性能分析

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摘要 针对现有基于分层体系结构的卫星网络存在覆盖盲区的问题, 尤其是难以提供对特定地区或高纬度地区的覆盖服务, 提出一种LEO/HEO/GEO三层卫星网络体系结构, 在此基础上对三层卫星网络的层间星间链路几何特性进行了分析, 并应用STK进行了仿真。仿真结果表明在该三层卫星网络中, GEO层中卫星可24小时不间断地与LEO层及HEO层中所有卫星建立动态层间星间链路。

关键词

[卫星网络](#) [分层体系结构](#) [性能分析](#) [层间星间链路](#) [低地球轨道](#) [高椭圆轨道](#) [同步地球轨道](#)

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Performance analysis of inter-layer ISLs in triple-layered LEO/HEO/GEO satellite networks

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Abstract

Considering the problem of blind coverage area brought by the satellite networks based on the hierarchical architecture, particularly the difficulty to provide the coverage over the special regions or the areas of high latitudes, a novel triple-layered LEO/HEO/GEO satellite network architecture is proposed. On the basis of the novel architecture, the geometric parameters of the inter-layer Inter-Satellite Links (ISLs) within a triple-layered satellite network are analyzed, and the performance of the inter-layer ISLs is also simulated via Satellite Tool Kit (STK). Simulation results demonstrate that the satellites in GEO layer can maintain the inter-layer dynamic ISLs with all the satellites in both LEO layer and HEO layer with 24-hour uninterrupted.

Key words

[satellite networks](#) [hierarchical architecture](#) [performance analysis](#) [inter-layer inter-satellite links](#) [Low Earth Orbit \(LEO\)](#) [Highly Elliptical Orbit \(HEO\)](#) [Geostationary Earth Orbit \(GEO\)](#)

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