عنوان مقاله:

Designing triplet LEO Satellite Constellation with three Adjacent Satellites

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خلاصه مقاله:

Genetic Algorithm can be applied in the optimization design of satellite constellation, which is imperative in various fields like communication, surveillance and navigation. Opposite goals, such as optimizing performance and reducing the number of satellites in constellations along with low cost of construction and launch, have been analyzed in this paper. This paper focuses on a suitable and lucrative method for designing a conceptual model of satellite constellation using the GA method. There are many options that could be chosen as acceptable solution to implement a LEO satellite constellations with some adjacent satellites on different orbits. Each option should be accurate assessment based on various indicators such as mass, reliability, cost and technology constraint (complexity). Important constraints including the number of satellites, orbit planes and etc. are discussed. A triplet LEO constellation with three adjacent satellites on different orbits is proposed by considering coverage capability and precession. For regional coverage of the area on Earth, a special genetic algorithm model is designed for Leo triplet constellations. The optimal solution can enhance the capability of communication and navigation intensively. The performance of proposed algorithm is corroborated by the simulation results and indicates that it is feasible and effective.

کلمات کلیدی:

Triplet Constellation, LEO Satellite coverage, Orbit, Genetic Algorithm, assessment Costing trade off