
A method of satellite constellations orbital construction for operational global monitoring problem solution

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The article presents analytical calculations and numerical modeling results in the selection of optimal satellite constellations construction for operational global monitoring. The article describes a method of satellite constellations construction orbital, the method ensuring maximum break minimization in the observation of any point on the Earth's surface for given survey characteristics from the spacecraft. We compared the results obtained by different authors determining the maximum break minimization values in observation for operational satellite constellations global monitoring for a given apparatus number in the constellation and their survey characteristics. We showed that the described methodology application for the satellite constellations construction, taking into account onboard equipment specified characteristics, makes it possible to reduce the problem to a one-parameter search for the best constellation system configuration from the latitude argument of the satellites in it, and determine longitude of the ascending node analytically. The obtained results make it possible to simplify the methodology for searching the optimal satellite constellation configuration for a periodic global survey.

Keywords: spacecraft, satellite constellation, operational global monitoring, one-route satellite constellations, a break in the observation, inter-track offset, longitude of the ascending node

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