

A. P. ALPATOV, YU. M. GOLDSTEIN

BALLISTIC ANALYSIS OF ORBITS DISTRIBUTION OF SPACECRAFT FOR DIFFERENT FUNCTIONAL MISSIONS

Institute of Technical Mechanics of the National Academy of Sciences of Ukraine and State Space Agency of Ukraine, 15, Leshko-Popel Str., 49005, Dnepr, Ukraine; e-mail: aalpatov@ukr.net; jura_gold@meta.ua

The paper focusses on the procedure and analysis of the results of ballistic studies on near-Earth space filling with orbits of communications satellites, navigational satellites, and Earth remote sensing satellites. The study presents the near-Earth orbits classification. In the present work, composed histograms of spacecraft orbits distributions on Keplerian orbital elements have been used to analyze from the data of an actual dynamic base of space objects. The ballistic analysis of near-Earth space filling with spacecraft orbits emerged the special features and variations in their space distribution. The research results can be used to emerge the regions of an increased probability of conflicts between the existing and designed spacecraft, to formulate requirements for inter-orbital maneuvers, as well as to schedule and perform alternative space activities.

Keywords: *near-Earth space, spacecraft, catalogue of space objects, space activities.*

1. Veniaminov S. S., Chervonov A. M. Space Debris: Threat for Mankind. M.: IKI RAN. 2013. 207 p. (*in Russian*)
2. Nazarenko A. I. Simulation of Space Debris. M.: IKI RAN. 2013. 216 p. (*in Russian*)
3. Elyasberg P. Ye. Introduction to the Theory of Flight of Artificial Earth Satellites. M.: Nauka. 1965. 540 p. (*in Russian*)
4. Basics of the Theory of Spacecraft Flight (Edited by G. S. Narimanov, M. K. Tikhonravov. M.: Mashinostroenie. 608 p. (*in Russian*))
5. Engineer's Handbook for Space Technology / Edited by A. V. Solodov. M.: Voenizdat. 1974. 430 p. (*in Russian*)