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ANALYSIS OF WAYS AND MODELS OF DEPLOYMENT OF SPACE
TETHERED SYSTEMS

Space tethered systems consisting of satellites conducting with flexible wires (tethers) can form the basis for advanced facilities for removing space debris from near-earth orbit. This raises the question of the deployment of such systems in orbit. The work subject is to analyze ways of the deployment of tethered systems and mathematical models of their dynamics for problems of spacecraft removal. Two basic classes for deployment systems (impulse and quasi-static) are established and compared. A mathematical model for the deployment, in which the tether is represented by the set of N-material points, was proposed. Effects of the tether mass on the system deployment are examined. It is shown that the tether mass does not significantly affect the deployment way without considering forces of aerodynamic drag at a slow deployment of the tether (at the speed up to 1 m/s).

Keywords: space tethered system, deployment, mathematical model, tether mass.

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