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CONDITIONS OF OPTIMAL TRAJECTORY FOR CONSTELLATION OF NANOSATELLITES INJECTED BY AEROSPACE SYSTEM

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The paper deals with the determination of the conditions for constructing an optimal launch trajectory for the nanosatellite constellation injected by the aerospace system. These conditions satisfy both the main and alternative requirements for optimal trajectories, as well as use efficiently the power resources of an integrated dynamic system. The methods of mathematical modeling, variation calculations, optimal control, and numerical integration are applied.

The paper proposes the method for building the optimal trajectories of an integrated dynamic system. It includes the enhancing concept applied to not only the optimization criterion and the phase state vector of a launch vehicle, but to limitations imposed on the trajectories of the separated head rockets as well. This method satisfies both the basic and alternate requirements for optimal trajectories.

It is concluded that the proposed method allows replacing the initial problem of the complex-limitations optimization with other simpler problem wherein cross couplings are excluded. In this case, the solution of this problem satisfies given requirements and coincides with the solution of the initial problem.

Keywords: *integrated dynamic system, optimization, trajectory, nanosatellites.*

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