

ORBITAL TETHER SYSTEM MOTION EQUATIONS CONSIDERING SPACE VEHICLE VIBRATIONS

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The paper describes a mechanical system that includes a space vehicle (SV), a tether and end load. The SV is presented as a solid body that executes the motion of and around the centre of inertia under the effect of gravitational moment and tether tension moment. A mathematical model of plane motion of the mechanical system presented is obtained with the help of a Lagrangian equation of the second order. It is shown that the model obtained can be used both for tether system deployment analysis and for the study of the SV behavior.

Space vehicle, tether, orbital motion, vibrations, Lagrangian equations, plane motion.

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