

ASTRODYNAMICS SYMPOSIUM (C1)  
Multibody Dynamics (8)

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## ON DYNAMICS OF CASTING A NET STRUCTURE OF FLEXIBLE CABLES ON ORBIT

**Abstract**

Orbital net systems are new species of space tether systems. It utilizes a fully spread net structure of flexible cables to achieve a "soft" capture without contact of two orbital bodies and with tolerance of positional errors and/or errors of velocity. The mission concept of a orbital net capture has great potential to dispose abandoned satellites or space debris, which proved to be very dangerous to space assets in the recent accident of collision of two satellites. This paper built a dynamic model with rigid bodies, flexible tether structures and their dynamic couplings taken into account, focused on casting process of a net structure on orbit. The influence of two pivotal parameters, the vectors of casting velocities and equivalent damping coefficient as a tether property, were investigated thoroughly. The result shows the possibility of such a novel mission concept and gives some insight of the dynamics of casting a flexible net structure on orbit.