

ON THE DETERMINATION OF THE TETHER LENGTH FOR AN EXPERIMENTAL ELECTRODYNAMIC SYSTEM

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The aim of this paper is to analyze the dependence of the tether length of a small experimental electrodynamic space tether system (EDSTS) without additional contactors required for the EDSTS operation in the anode-cathode mode on the tether and end body parameters and the orbital parameters. It is shown that for each case of EDSTS motion there exists a critical tether length such that for shorter lengths one should not expect any steady-state mode of interaction with the plasma which would provide a practically measurable current. For an EDSTS to operate in the anode-cathode mode, its length must be greater than the critical one.

The results of this study may be used in choosing the tether parameters for a specific experiment, i. e. an experiment with given end bodies, orbital parameters, and measuring systems.

Keywords: *small electrodynamic space tether system, spacecraft deorbiting system, geometrical parameters, critical length.*

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