

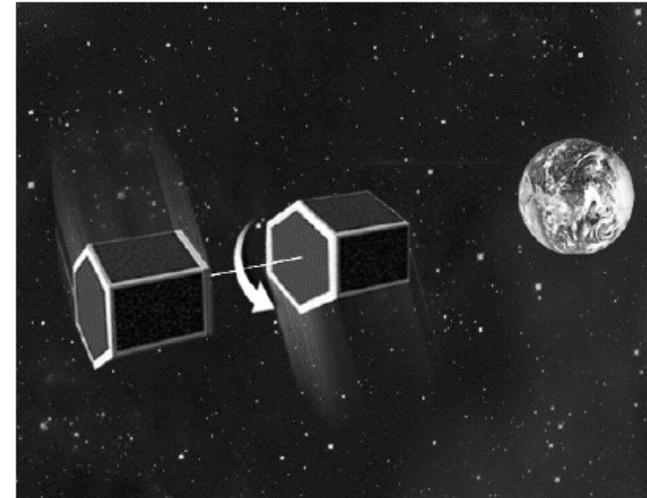
TAGS II: Tether Electrodynamic Spinup and Survivability Experiment (TESSX)

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Proposal No.: 02-II 020047

Description and Objectives

ORBITEC, proposes to develop TAGS II: Tether Electrodynamic Spinup and Survivability Experiment (TESSX). TESSX is a spinning tethered space system, consisting of two end masses separated by an electrodynamic tether. TESSX is believed to be a critically important step in the evolution of several tether applications, addressing: tether electrodynamics; tether survivability and safety; tether deployment, management and tracking; multi-amp current collection and emission; and system deployment and spin-up.



Approach

The Phase II program will draw on the successful results of the Phase I work and include: the development and delivery to NASA of a multi-strand computer controlled tether deployment system; detailed TESSX systems dynamics and electrodynamics analysis and experimental verification; development of a detailed and optimized TESSX architecture, compatible with ELV constraints; a Phase III TESSX cost analysis and development plan; and commercial applications planning.

Subcontractors/Partners

The University of Texas at Dallas (UTD)
Dr. Andre Mazzoleni (independent contractor)
Smithsonian Astrophysical Observatory (SAO)

Schedule and Deliverables

- The proposed program duration is 24 months long
- A multi-strand computer controlled tether deployment system will be developed, delivered and demonstrated to NASA at the completion of the program

NASA & Commercial Applications

This work would have direct relevance to a variety of applications, including: tethers for in-space satellite propulsion via momentum exchange or direct electrodynamic boost; generation of artificial gravity; reentry of drag-decelerated tethered satellites/capsules; short-term power generation using electrodynamic tethers; and many other areas. Terrestrial spin-off applications to support the textile, paper, and fishing industries are also possible.