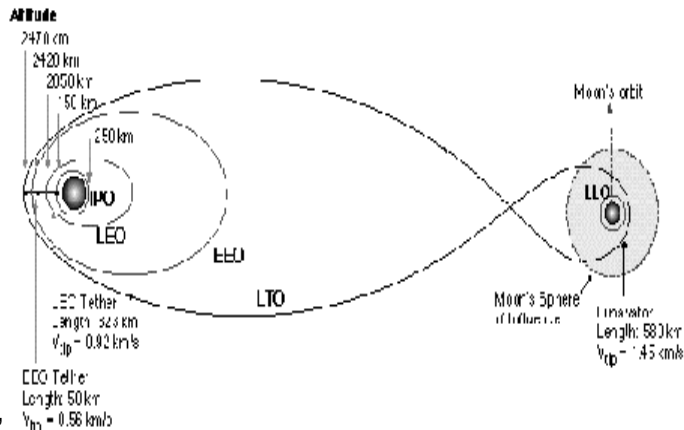


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"Cislunar Tether Transport System"

Systems composed of several rotating tethers in orbit can provide a means of transporting payloads and personnel between Low-Earth-Orbit and the lunar surface with little or no propellant required. The underlying concept is to build a reusable transport system that utilizes rotating tethers to throw payloads to the moon and to catch return payloads sent from the moon. By balancing the flow of mass to and from the moon, the total energy of the system can be conserved, eliminating the need for the large quantities of propellant required by rocket systems. Previous studies have shown the potential of tether systems for making LEO to GEO and LEO to Lunar travel affordable by greatly reducing the amount of propellant that must be launched into orbit.



These studies, however, have not addressed the credibility of their designs. The proposed effort will develop a design for a Cislunar Tether Transport System that is both technically feasible and economically viable by addressing three key aspects of the system.

First, the effort will develop a realistic scenario for repeatedly transferring payloads from LEO to the lunar surface that takes into account the full complexities of the orbital mechanics of the Earth-Moon system, including non-spherical gravitational potentials, inclined orbit dynamics, and luni-solar perturbations. Second, it will develop a design for the system that can be built incrementally, with early stages earning revenue to pay for the development of later stages by serving as boost facilities for MEO and GEO traffic. Third, the effort will develop a design for the first stage of the system, a LEO "rotating electrodynamic force tether" that combines the technology of electrodynamic tethers with the principles of rotating momentum-transfer tethers to enable multiple payloads to be boosted from LEO to higher orbits with no propellant needed.