NASA SBIR/STTR Technologies

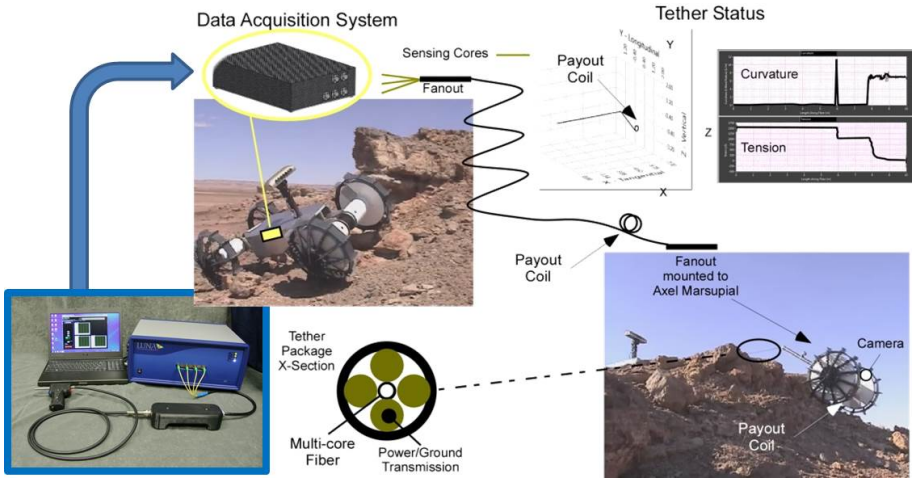
S4.02-7734 - Miniaturized Interrogation System for Marsupial Rover Sensing Tether

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Identification and Significance of Innovation

Luna will develop a small size, self-calibrating, interrogator which will enable the tether used by marsupial rovers (e.g. Axel) to become an active sensing device, reporting shape, rover position, and distributed tension;Reducing the Size, Weight, and Power (SWaP) of the instrument will result in the ability to mount a complete sensing tether system on a deployable rover, allowing for autonomous operation;Self-calibration capability allows the system to maintain performance during long field deployments



Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

Objectives
Establish size, weight, and power (SWaP) targets for the miniaturized system;Demonstrate ability to process data to distributed shape and tension values on a small scale digital signal processing board; Determine potential changes to the optical network and data acquisition front end for further miniaturization
Work Plan: Establish target metrics and specifications;Select suitable DSP platform for prototyping;Adapt sensing algorithms for DSP board;Develop preliminary self-calibration techniques;Demonstrate performance using existing data acquisition hardware coupled with new signal processing tools;Refine architecture for miniaturized data acquisition hardware.

NASA Applications

Robotic exploration missions (TA 4.1.1, TA 4.2.6) including: Mars exploration; Astrobiology field lab; Network landers; Europa explorer

Non-NASA Applications

Large scale robotic manipulators; Improved operations of payload tethers from rotorcraft; Search and rescue robotics; Unmanned underwater vehicles (UUVs); Non destructive evaluation.

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NON-PROPRIETARY DATA