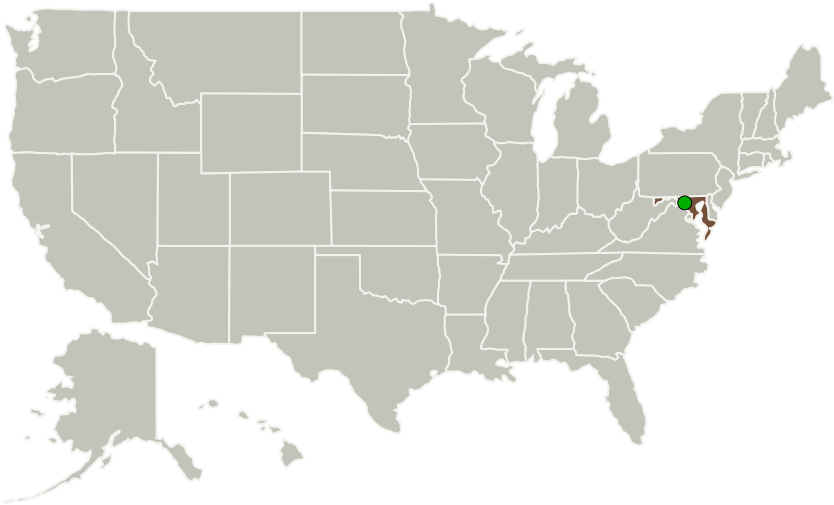
VLBI Antenna Calibration via GPS, Phase I

Completed Technology Project (2010 - 2010)

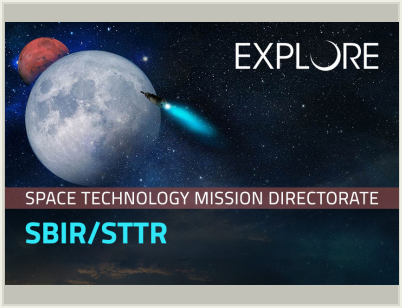
Project Introduction

We propose to investigate and develop an inexpensive system to determine: 1)VLBI antenna properties such as axis-offset, non-intersection of axis and antenna reference point; 2) Gravitational and/or Thermal deformation; 3) The eccentricity vector from the VLBI antenna to nearby GPS receivers. The proposed system involves using several GPS receivers in close proximity driven by a common clock. Because of their proximity, atmosphere and ionosphere errors are common, and vanish when we take the difference of measurements from different receivers to a common a satellite. Satellite clock errors also vanish in this difference. Since the receivers use a common clock, receiver clock error also vanishes. The remaining error source is GPS multipath which can be mitigated.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
NVI Inc.	Lead Organization	Industry	
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Completed Technology Project (2010 - 2010)

Primary U.S. Work Locations

Maryland

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139549)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

NVI Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

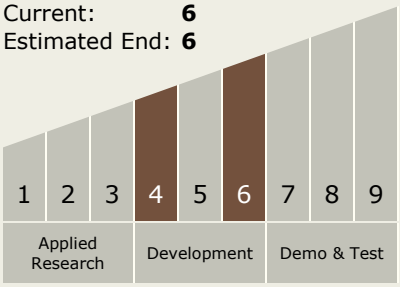
Carlos Torrez

Principal Investigator:

Daniel S Macmillan

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  └ TX05.4 Network Provided Position, Navigation, and Timing
    └ TX05.4.1 Timekeeping and Time Distribution

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System