Formation Flying/Satellite Swarm Concept Project

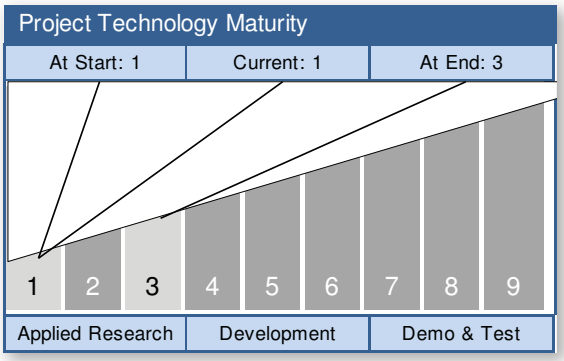
Center Innovation Fund: KSC CIF Program

Space Technology Mission Directorate (STMD)

National Aeronautics and Space Administration

ABSTRACT

NASA needs a method of not only propelling and rotating small satellites, but also to track their position and orientation. We propose a concept that will, for the first time, demonstrate both tracking and propulsion simultaneously in the same system.



Technology Area: In-Space Propulsion Technologies TA02 (Primary)

ANTICIPATED BENEFITS

To NASA unfunded & planned missions:

Future satellite swarms and formation flying systems may use this technology to provide both forces and torques as well as tracking information.

To other government agencies:

Darpa has shown interest in this type of technology

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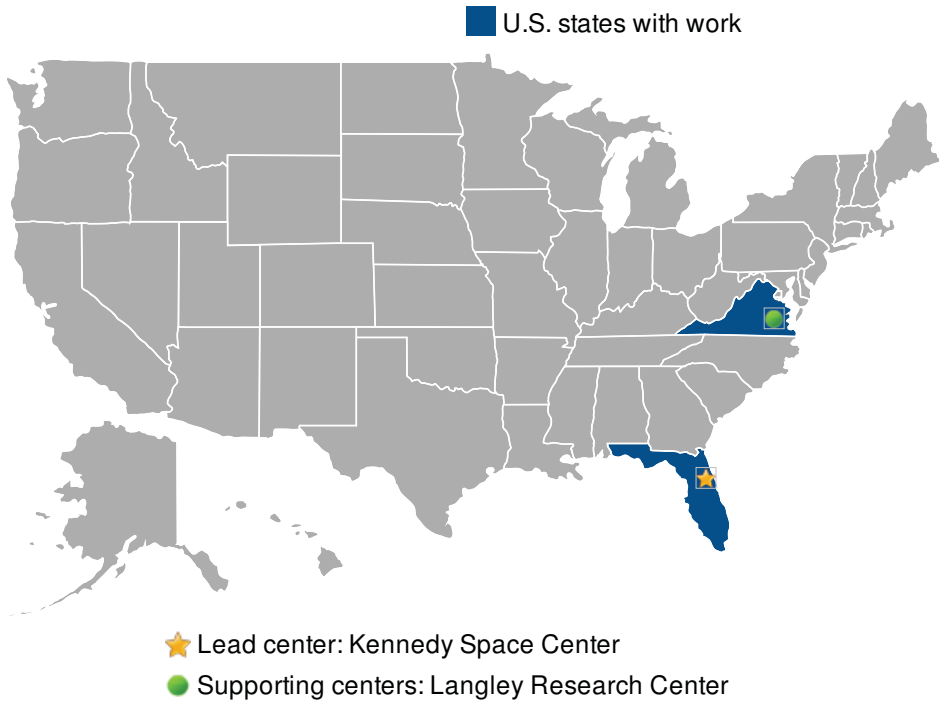
Read more on the last page.



DETAILED DESCRIPTION

NASA plans to build a lab bench operational system capable of tracking the position and orientation of small satellites as well as producing forces and torques on them. The goal is to be able to direct a satellite to move to various positions and orientations and then see how well it can accomplish this. The position resolution achieved is a major goal of the project.

We have previously demonstrated one directional forces and single torques to a satellite. We analyzed this and published a technique to extend it to more dimensions.

This project began on May 1st 2014. As results are developed more information will be provided to this site.

MANAGEMENT

Program Executive:
John Falker

Program Managers:
Karen Thompson
Nancy Zeitlin

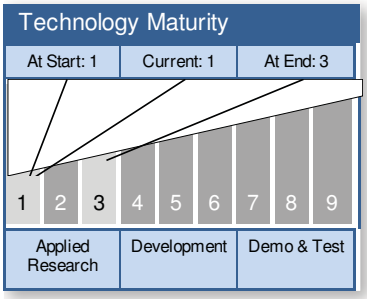
Project Manager:
Robert Youngquist

Principal Investigator:
Robert Youngquist

Co-Investigator:
Mary Coan

TECHNOLOGY DETAILS

A New Formation Flying/Satellite Swarm Concept



TECHNOLOGY DESCRIPTION

This is a new method for providing both propulsion and torque to free flying satellites and for tracking their positions and orientations.

This technology is categorized as a hardware system for other applications

- Technology Area
  - TA02 In-Space Propulsion Technologies (Primary)

CAPABILITIES PROVIDED

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Performance Metrics		
Metric	Unit	Quantity
angular resolution	rad	1
translational position resolution	mm	2

ANTICIPATED BENEFITS

To the commercial space industry: (CONT'D)

Contactless tracking of a system may have commercial applications. Some of NASAs prior work in this area has been patented and commercialized.