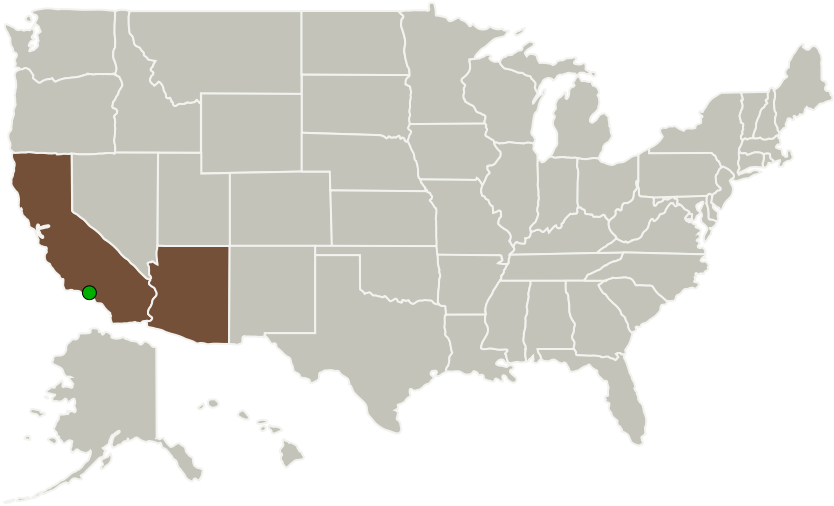
In-situ Airborne Sampler for Advanced Guided Dropsonde, Phase I

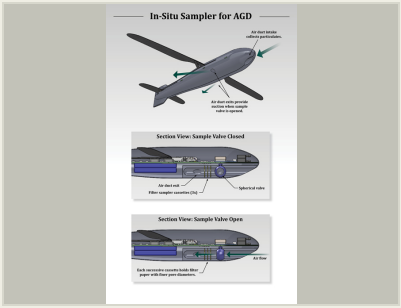
Completed Technology Project (2013 - 2013)

Project Introduction

The proposed innovation is a low-cost, retrievable and reusable, autonomously guided dropsonde capable of in-situ atmospheric measurements. The proposed effort will focus on the engineering work involved with the retrieval of volcanic ash plume samples. This work will build upon a previous NASA SBIR Phase I project Latitude Engineering completed in 2011: the development of an Advanced Guided Dropsonde (AGD). Though the tested prototype received favorable reviews, funding restructuring of the SBIR program within NASA prevented funding for Phase II. To keep the momentum behind this innovative airborne platform, Latitude Engineering is proposing to build upon this accomplishment: refine the current dropsonde design and develop a sampling system for atmospheric particulates that will be integrated into this 4 cm diameter research vessel. Miniaturized particulate sampling equipment for airborne missions is not commercially available. Even for full scale systems, many research programs develop their own collection and sensor systems. With the small size limitations of the AGD, a multi-stage particulate sampler can be developed that can collect size segregated particulate including aerosols. With the significant need for atmospheric particulate sampling, the AGD can offer unprecedented access to atmospheric samples including those at high altitudes. The key goals of this Phase I proposal are to demonstrate the capability of the AGD to be released from a host manned aircraft, collect an atmospheric particulate sample from a pre-programmed altitude and location, and deliver the protected sample to a pre-programmed recovery area. This system, engineered to be cost compatible with existing dropsonde launch systems, is recoverable and re-useable.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Latitude Engineering	Lead Organization	Industry	Tucson, Arizona
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
Arizona	California

Project Transitions

May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140715)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Latitude Engineering

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

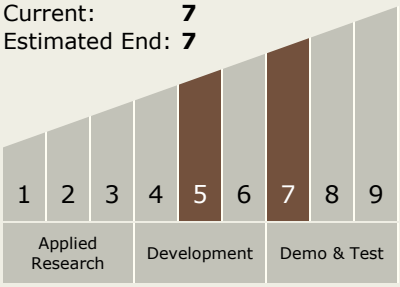
Carlos Torrez

Principal Investigator:

Jason M Douglas

Technology Maturity (TRL)

Start: **5**
Current: **7**
Estimated End: **7**



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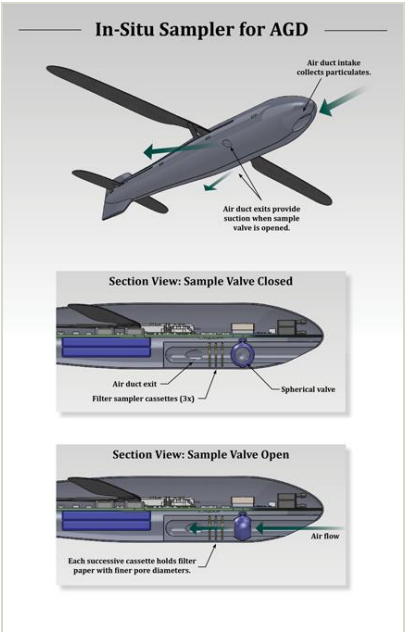
Images



Project Image
In-situ Airborne Sampler for Advanced Guided Dropsonde
(https://techport.nasa.gov/image/135458)

Technology Areas

Primary:

- TX04 Robotic Systems
  └ TX04.3 Manipulation
    └ TX04.3.4 Sample Acquisition and Handling

Target Destinations

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