



T0110-P WetLab-2 Fluidic Subcomponent Testing

Problem Statement

- The goal of the WetLab-2 project is to provide gene expression analysis of samples on the ISS.
- In order to prepare samples for analysis on orbit, there are a number of fluidic operations that need to occur.
- Parabolic flight testing will allow us to identify issues and make modifications which will greatly mitigate the risk of failures during the ISS verification flight.
- Future users: Numerous PIs that study gene expression changes in space.

Technology Development Team

- PI: Macarena Parra, Lockheed Martin/Ames Research Center
Macarena.Parra@nasa.gov
- Ames Research Center, Code R, Scott Richey,
Charles.S.Richey@nasa.gov

Proposed Flight Experiment

Experiment Readiness:

- September 26, 2013.

Test Vehicles:

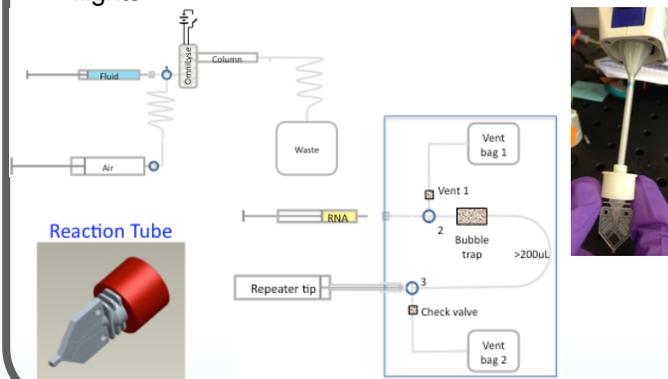
- Parabolic aircraft.

Test Environment:

- These subcomponents have not previously flown.
- The WetLab-2 verification flight to the ISS is scheduled for SpaceX-5 (August 2014)

Test Apparatus Description:

- Six different subcomponents of the WetLab-2 system will be tested during parabolic flight.
- All subcomponents will be tested inside a glovebox that has previously flown on parabolic flights



Technology Maturation

- Subcomponents are currently between TRL 5 and 6 – component prototypes have been successfully tested but final packaging is not complete.
- Components must be tested outside of the final packaging to allow for observation.
- To mature technology beyond current TRL requires parabolic testing so prototype is tested in “operational” environment

Objective of Proposed Experiment

- Parabolic flight testing will allow us to test the following six subcomponents: OmniLyser and column, Reaction Assembly Module, Tube loading, Bead rehydration, Homogenizer, and the sample transfer tool.
- Data from this flight will allow us to implement necessary changes before the on orbit verification flight.

Technology Areas addressed TA08. Will also support TA06 once WetLab-2 system is installed on ISS.

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