



T0073-S Radial Core Heat Spreader (RCHS)

Problem Statement

- Passive thermal control of higher power radioisotope power systems requires heat pipe technologies capable of performing during the launch environment
- The RCHS heat pipe fills the technology gap required for higher power heat rejection.
- Thermal performance has been validated for operation in 0-2g environments but not launch related accelerations
- Suborbital flight testing of the RCHS heat pipe will validate thermal performance during launch and microgravity conditions
- Science Mission Directorate is seeking higher power technologies for future discovery class missions

Technology Development Team

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Thermal Energy Conversion Branch;
Stirling Cycle Development

Proposed Flight Experiment

Experiment Readiness:

- The experiment has completed all qualification testing for flight and has been delivered for payload integration

Test Vehicles:

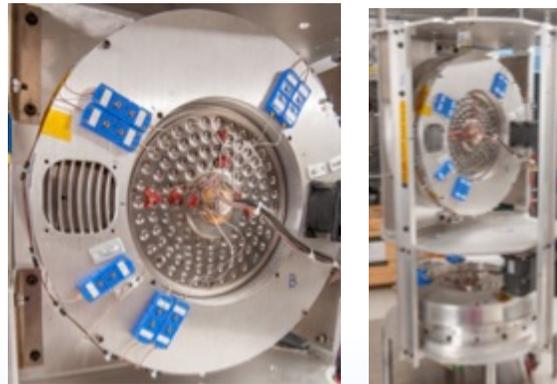
- Sounding Rocket capable of providing greater than five minutes of microgravity and up to 120 lbs. of experiment payload

Test Environment:

- Typical Sounding Rocket launch accelerations, greater than 5 minutes of microgravity

Test Apparatus Description:

- 130Wt RCHS technology for the Advanced Radioisotope Stirling Generator (ASRG)



Technology Maturation

- The RCHS must reject 130Wt from the I.D. to the O.D. during launch and microgravity environments in both the horizontal and vertical configuration
- The technology is at its last stage of development validation using a suborbital vehicle to simulate the launch of a radioisotope power system
- The deadline to achieve this maturation is the end of fiscal year 2015

Objective of Proposed Experiment

- The objective of the flight experiment is to verify that the RCHS heat pipe technology is capable of performing through the launch and microgravity environment
- The temperature and power data collected through telemetry will be used to verify performance throughout the flight