

A Heat Switch for Space Applications

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Contract No.: NNX10CE65P

Identification and Significance of Innovation

NASA exploration and astrophysics missions require active thermal control. We propose to develop a heat switch that accomplishes this task over a wide temperature range from high to cryogenic temperatures.

TRL Range at Contract End: 2-3

Technical Objectives

To develop a thermal switch that:

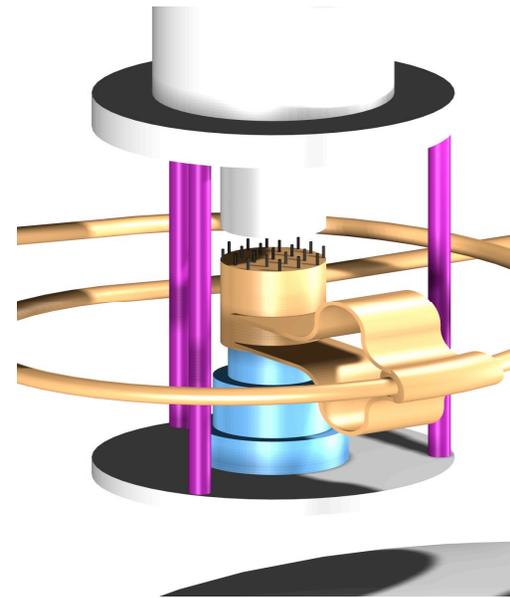
- 1) has a high on/off conductance ratio;
- 2) consumes very little power for actuation;
- 3) is reliable for long-life applications.

Work Plan

- 1) Employ a novel interface material to enhance thermal contact conductance of a metal to metal contact heat switch.
- 2) Develop a mechanical heat switch using an actuator.
- 5) Test heat switch performance down to 20 K.

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The heat switch isolating a cooler from a flow loop.

NASA Applications

NASA Exploration missions that require transportation, storage, or in-situ production of liquid cryogens. Lunar missions that require active thermal control. Astronomical missions that require cooling of detectors and optics.

Commercial Applications

Applications that require thermal isolation during part of a process cycle. The thermal interface material can be used in electronic, aerospace, and communication industries.