Design and Fabrication of a Breadboard, Fully Conductively Cooled, 2-Micron, Pulsed Laser for the 3-D Winds Decadal Survey Mission

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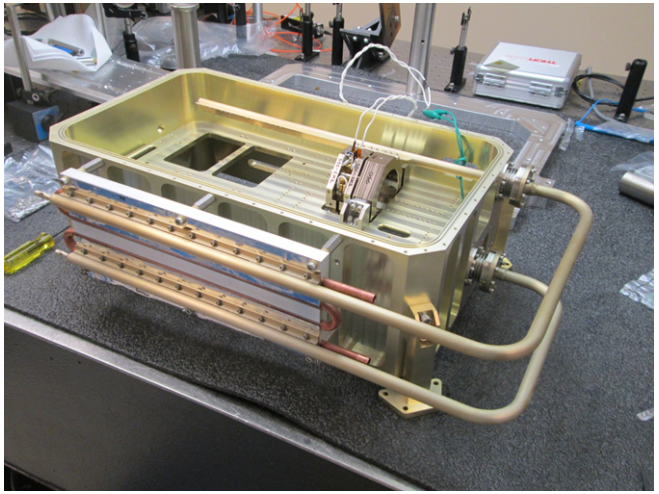
Objective

- Design and fabricate a space-qualifiable, fully conductively-cooled, 2-micron pulsed laser breadboard meeting the projected 3-D Winds measurement concept
    - Utilize improvements in key technologies including high-power, long-life space-proven 804 nm pump diodes; derated diode operation, and heat pipe conductive cooling



2-Micron Pulsed Laser for 3-D Winds

Accomplishments

- Designed and completed a robust mechanical system for a two micron laser based on the ICESAT-II enclosure design
- Designed and demonstrated an ammonia heat pipe based heat extraction system to handle the 180 watts of system power
- Built and tested a conductively cooled, Q-switched ring oscillator demonstrating 10 Hz operation with output energy >80 mJ in long pulse mode
- Demonstrated a two-stage conductively cooled amplifier with a gain of >3

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$TRL_{in} = 3$ $TRL_{out} = 3$