

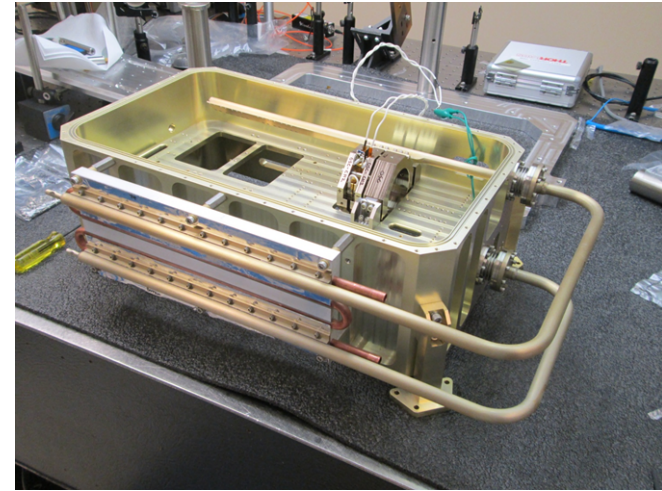


Design and Fabrication of a Breadboard, Fully Conductively Cooled, 2-Micron, Pulsed Laser for the 3-D Winds Decadal Survey Mission

PI: Upendra Singh, NASA LaRC

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

Co-Is/Partners: Mulugeta Petros, Jirong Yu, Michael Kavaya, LaRC; Floyd Hovis, Tim Shuman, Fibertek, Inc.

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