

EGU24-12444, updated on 24 Mar 2025
<https://doi.org/10.5194/egusphere-egu24-12444>
EGU General Assembly 2024
© Author(s) 2025. This work is distributed under
the Creative Commons Attribution 4.0 License.



Validation of the Radiometric Scales of GLAMR and Grande

Julia Barsi¹, Brendan McAndrew¹, Boryana Efremova², Andrei Sushkov³, Nathan Kelley⁴, and Brian Cairns⁵

¹NASA/Goddard Space Flight Center, Code 618, Greenbelt, United States of America (julia.barsi@nasa.gov)

²Geothinktank, Greenbelt MD

³Genesis Engineering Solutions, Lanham MD

⁴Science Systems and Applications, Inc, Lanham MD

⁵NASA/GISS, New York NY

The NASA/GSFC Code 618 Calibration Laboratories include the Radiometric Calibration Lab (RCL) and the Goddard Laser for Absolute Measurement of Radiance (GLAMR) facility. Both have large integrating sphere sources with NIST-traceable radiometric calibration.

The workhorse of the RCL is a 1-m integrating sphere with a 25.4-cm port, called Grande, illuminated by nine 150W halogen lamps, providing a broad-band radiance source (300 nm to 2400 nm). The radiometric calibration of Grande is NIST-traceable through calibrated FEL lamps and a transfer spectroradiometer.

GLAMR is a tunable-laser based system fiber coupled to a large integrating sphere, providing a full-aperture, uniform, monochromatic radiance source. The GLAMR system has two spheres; the one used for this study was a 50-cm sphere with a 20-cm port. The radiometric calibration is NIST-traceable through a set of calibrated transfer radiometers.

The Research Scanning Polarimeter was calibrated by both sources in 2023. There was a 3% discrepancy in the absolute radiometric calibration between the two systems. In order to investigate the discrepancy, a full wavelength scan of the GLAMR system was run, with the Grande spectroradiometer in front of the GLAMR sphere, along with two other spectroradiometers that are used to monitor Grande in real time. The analysis of this dataset should establish the source of the discrepancy between the two systems and bring the two radiometric calibration systems, Grande and GLAMR, within the combined uncertainties of the methods and instruments.