NIST Agency Report -- CEOS WGCV 24 November 8-11, 2005 Frascati, Italy

Raju Datla, Group Leader

Optical Technology Division
Physics Laboratory
National Institute of Standards and Technology
http://physics.nist.gov/Divisions/Div844/div844.html

Outline

- NIST/EOS Activities (Continuing)
- Upcoming NPOESS Calibrations
- New Collaborations
- Recommendation to Plenary

NIST/EOS Activities (Continuing)

• Robotic Lunar Observatory (ROLO) scale for radiance based on VEGA differs from NIST ROLO collimator based scale by more that expected. Tom Stone at USGS/ROLO and NIST staff addressing this problem.

•NIST hosted Total Solar Irradiance Workshop – July 18-20, 2005. Address the observed difference of 5 W/m^2 between the latest TIM and the old ACRIM series radiometers.

Radiance Calibration at ROLO

The USGS 0.5° collimator was designed as a standard source in order to establish traceability using laboratory standards, not values for Vega.
Impact: Uncertainty in values assigned to this in-situ calibration standard (the Moon).

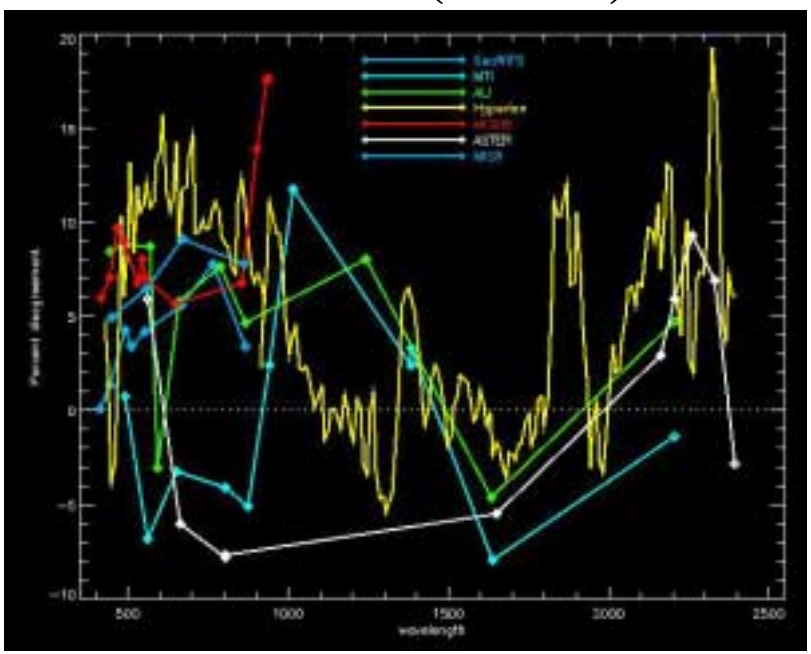
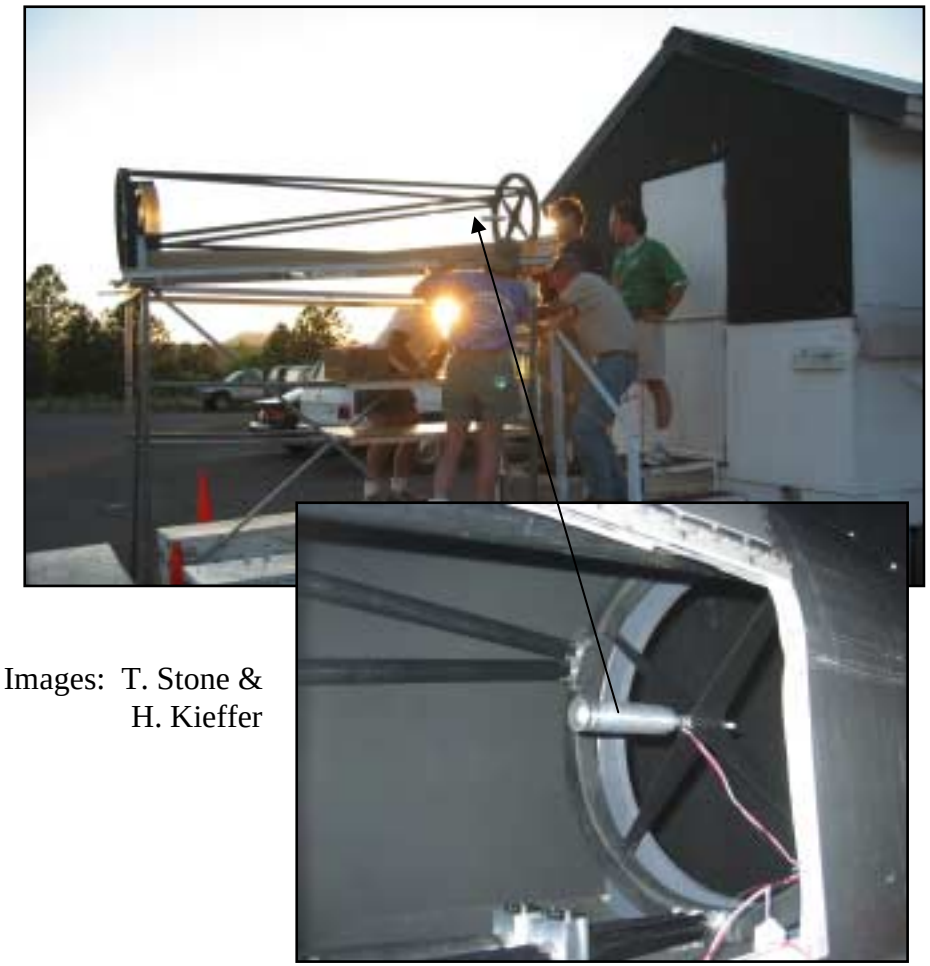
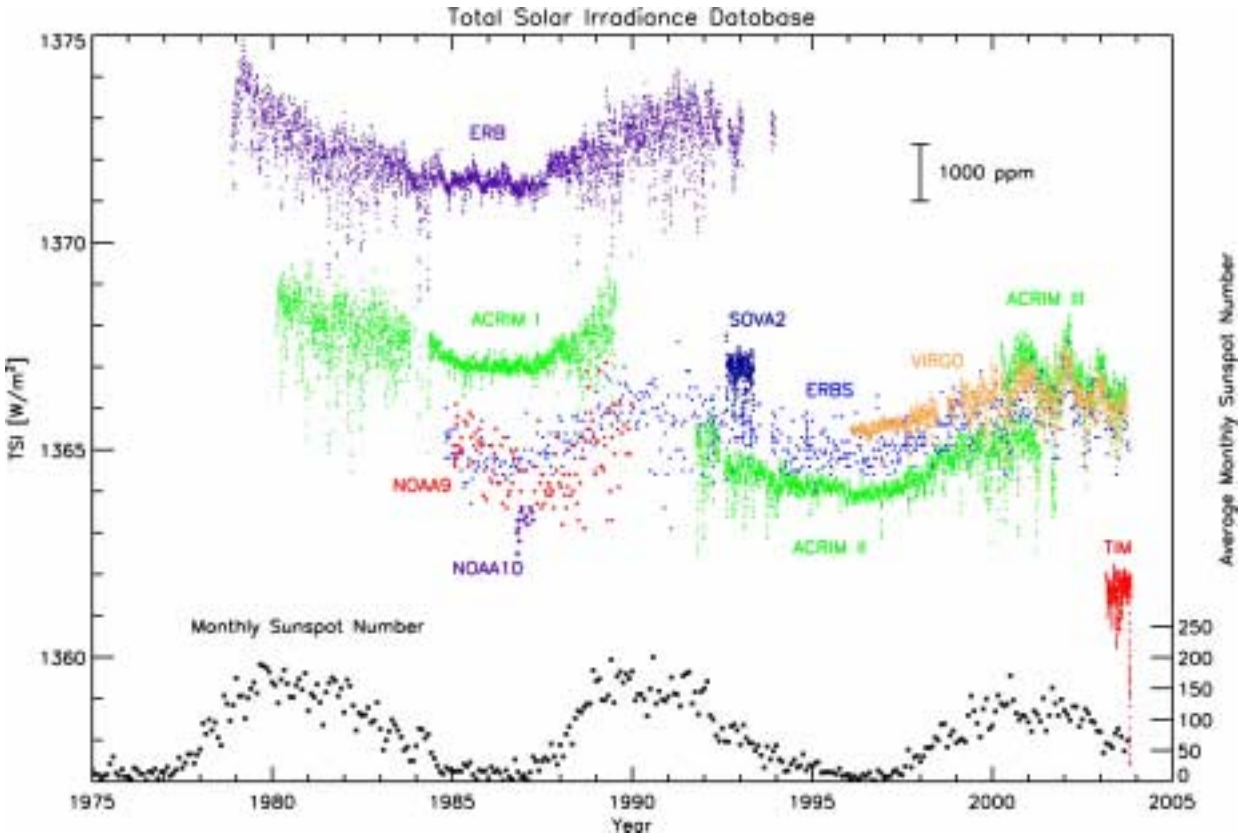


Image: T. Stone



Images: T. Stone & H. Kieffer

Measurements of Total Solar Irradiance



http://spot/colorado.edu/~koppg/TSI/

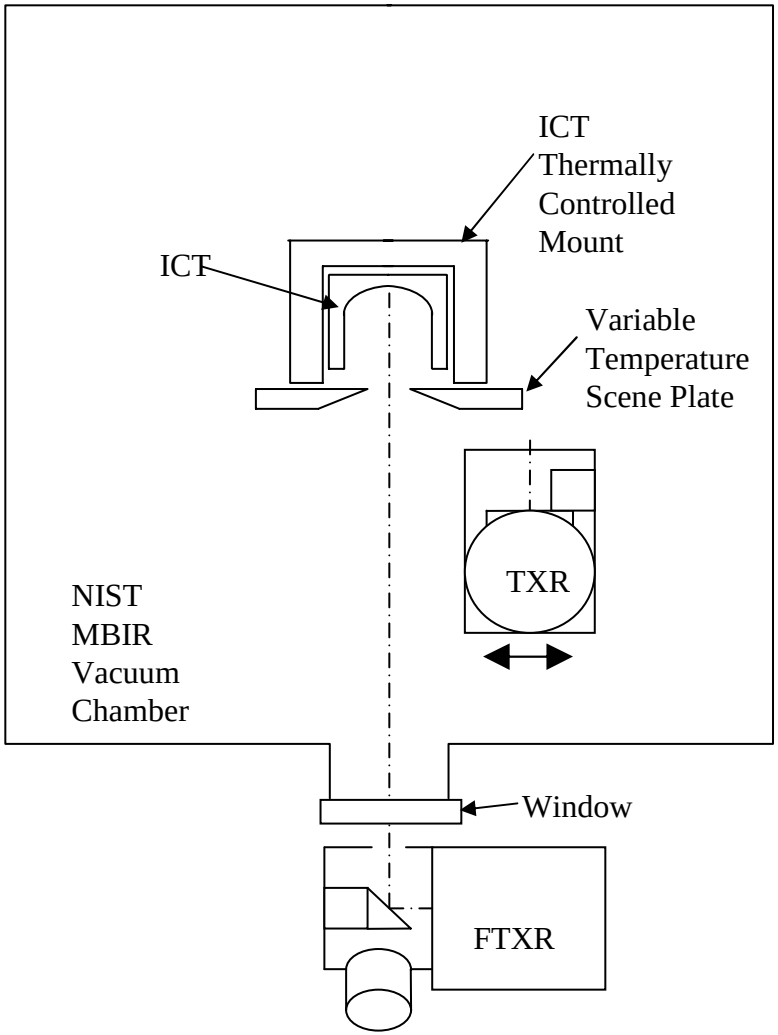
Outline

- NIST/EOS Activities (Continuing)
- Upcoming NPOESS Calibrations
- New Collaborations
- Recommendation to Plenary

Upcoming NPOESS Calibrations

- NPOESS CrIS blackbody will be tested at the NIST MBIR Facility

Test in preparation for NPOESS CrIS Calibration Blackbody (ICT)



- Purpose is to validate vendor's radiance scale.
- TXR is a filter radiometer.
- FTXR is an FTIR spectroradiometer.
- CrIS blackbody and TXR are in vacuum.
- FTXR views blackbody thru window.
- ICT controlled over its temperature range and radiometers measure emitted radiance.
- Separately, by widely varying temperature of the Scene Plate in front of the ICT, reflected radiance from the ICT is measured and used to infer ICT emissivity.

Outline

- NIST/EOS Activities (Continuing)
- Upcoming NPOESS Calibrations
- New Collaborations
- Recommendation to Plenary

New Collaborations

• NIST and Utah State University (USU), Logan, Utah, signed a MOU:

-NIST and Space Dynamics Laboratory at USU started collaboration to work towards SI traceability for Space Based Sensors.

- CALCON meeting (August 2006)

- Workshop 2 on Calibration for Satellite Sensors for Climate Change

Project Summary

NIST continues to collaborate with Earth observing programs to assess the accuracy of the radiometric characterization and calibration of flight sensors, as well as field equipment.

Earth Observing System (EOS)
Jim Butler, NASA/GSFC cal/val lead
Primary efforts, FY05: TSI workshop, calibration of Robotic Lunar Observatory telescopes

National Polar Orbiting Environmental Satellite System (NPOESS) and NPOESS Preliminary Project (NPP)
Karen St. Germain and Steve Mango, IPO
Primary efforts, FY05: OMPS cal/val at Ball, CrIS blackbody at NIST with TXR, publication of TXR verification of SBRS VIIRS blackbody radiance

Geostationary Operational Environmental Satellite (GOES) – R
Steve Kirkner, NOAA/NESDIS
Primary efforts, FY05: Plan for ABI calibration verification efforts; application of TXR measurements of the GOES Imager blackbody source

New Collaboration with USU/SDL for SI traceable Space based Radiometry

Recommendations to Plenary

Artifacts for down-stream characterization (programs should produce and archive “witness samples”)

“Witness samples” could be from the flight set, in order to ensure reproducibility of determined parameters.

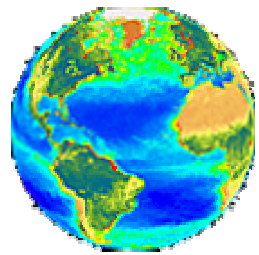
Acknowledgements

NIST Optical Technology Division Collaborators

- Leaders of the NIST Calibration Effort
  - Carol Johnson
  - Joe Rice
  - Steve Brown
- Other NIST Collaborators
  - David Allen
  - Raju Datla
  - Charles Gibson
  - Toni Littorja
  - Keith Lykke
  - Al Parr (Division Chief)
  - Jim Proctor
  - Bob Saunders
  - Howard Yoon

Numerous Other Collaborators, Including

- Jim Butler, NASA Goddard
- Steve Mango, IPO
- Hal Bloom, IPO
- Dennis Clark, NOAA
- Steve Kirkner, NOAA
- Mitch Goldberg, NOAA
- Chang Yong Cao, NOAA
- Tom Stone, USGS
- Chuck McClain, NASA Goddard



SeaWiFS

Department of the Air Force
http://www.af.mil/