

Status of IASI uncertainty budget

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GSICS Web Meeting on IR Reference Sensors
IASI Changes & Traceability & Uncertainty Report

Status on GSICS action

- Action GRWG_14.13 :

- ◆ IASI uncertainty budget and inter-comparison uncertainty budget on-going, to be used to write the IASI part of the “GSCIS Reference Traceability and Uncertainty Report”
- ◆ Due to a lack of human resources to work on it, our contribution was partially on stand-by.
- ◆ IASI uncertainty budget is planned to be done this year.
- ◆ A draft report will be sent in August / Beg. September to provide preliminary materials for Tim’s presentation at EUMETSAT conference in October.



GSICS-Reference

Global Space-based |
Inter-Calibration System

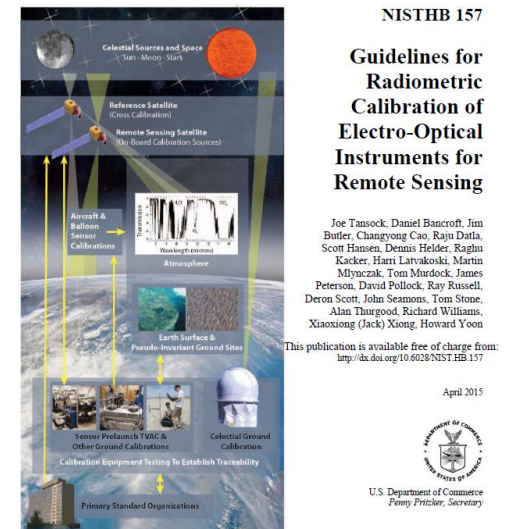
GSICS Infrared Reference
Sensor Traceability and
Uncertainty Report

Traceability to SI standards

- « Traceability to SI standards » means:
 - Providing a complete documentation of the measurements that were done on ground before launch
 - Calculate an uncertainty budget for our measurement with respect to the true absolute value
 - Traceability to SI is provided by the use of facilities on ground that can demonstrate a calibration or comparison to evidence its measurement capability all the way to a National Metrology Institute.
- An excellent reference is the “NISTHB 157 – Guidelines for Radiometric Calibration of Electro-Optical Instruments for Remote Sensing”

This publication is available free of charge from:

<http://dx.doi.org/10.6028/NIST.HB.157>



National Institute of Standards and Technology
Wida May, Acting Under Secretary of Commerce for Standards and Technology and Acting Director

IASI radiometric uncertainties

- The IASI lifetime requirement for **absolute calibration accuracy is 0.5 K** (maximum difference between measured and actual temperatures of a blackbody @ 280 K)
- Other requirements on radiometric calibration: orbit calibration repeatability (0.15 K), calibration lifetime repeatability (0.15 K), inter-channel calibration homogeneity (0.1 K), inter-pixel and scan angle calibration homogeneity (0.1 K).
- The IASI error budget is on-going, using pre-launch and on-orbit estimations of calibration parameter uncertainties.
- Pre-launch validation tests were done using several external blackbodies at different temperatures.
- An effort will be done to write the IASI budget in a similar way than the CrIS budget “Suomi-NPP CrIS radiometric calibration uncertainty”, David Tobin et al., JGRD vol 118 doi:10.1002/jgrd.50809

IASI radiometric uncertainties

- The main radiometric calibration contributors to IASI error budget are:
 - ◆ Non linearity (knowledge error and stability)
 - ◆ Black body temperature and environment temperature (measurement error and stability)
 - ◆ Black body emissivity (knowledge error and stability)
 - ◆ Scan mirror reflectivity