GSICS Report to CGMS-46 Plenary

CGMS-46-GSICS-WP01

19th GSICS Executive Panel, Bengaluru, India, 1-2 June 2018

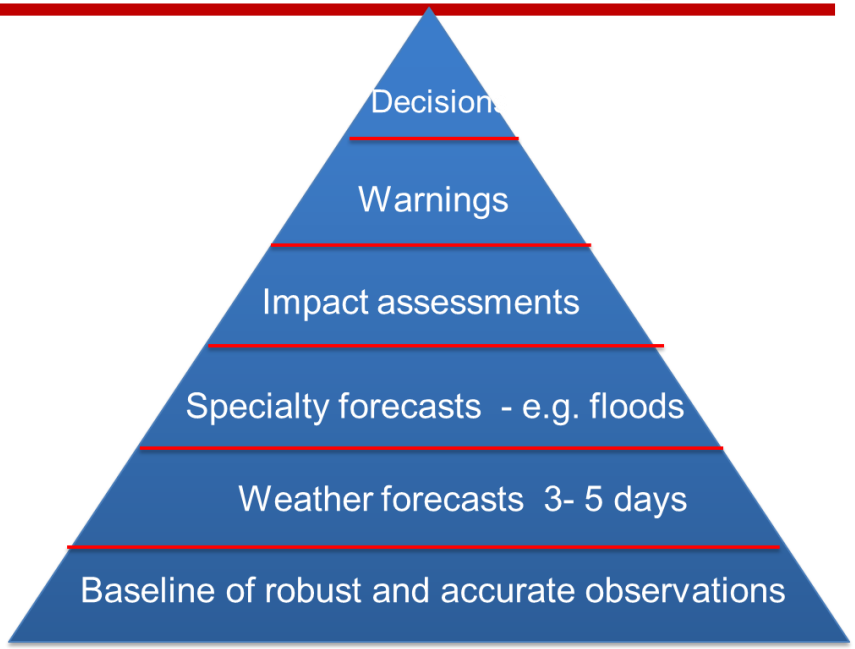
Mitch Goldberg (GSICS EP Chair)
Kenneth Holmlund (GSICS EP Vice-Chair)
Toshiyuki Kurino (WMO Secretariat)

Topics

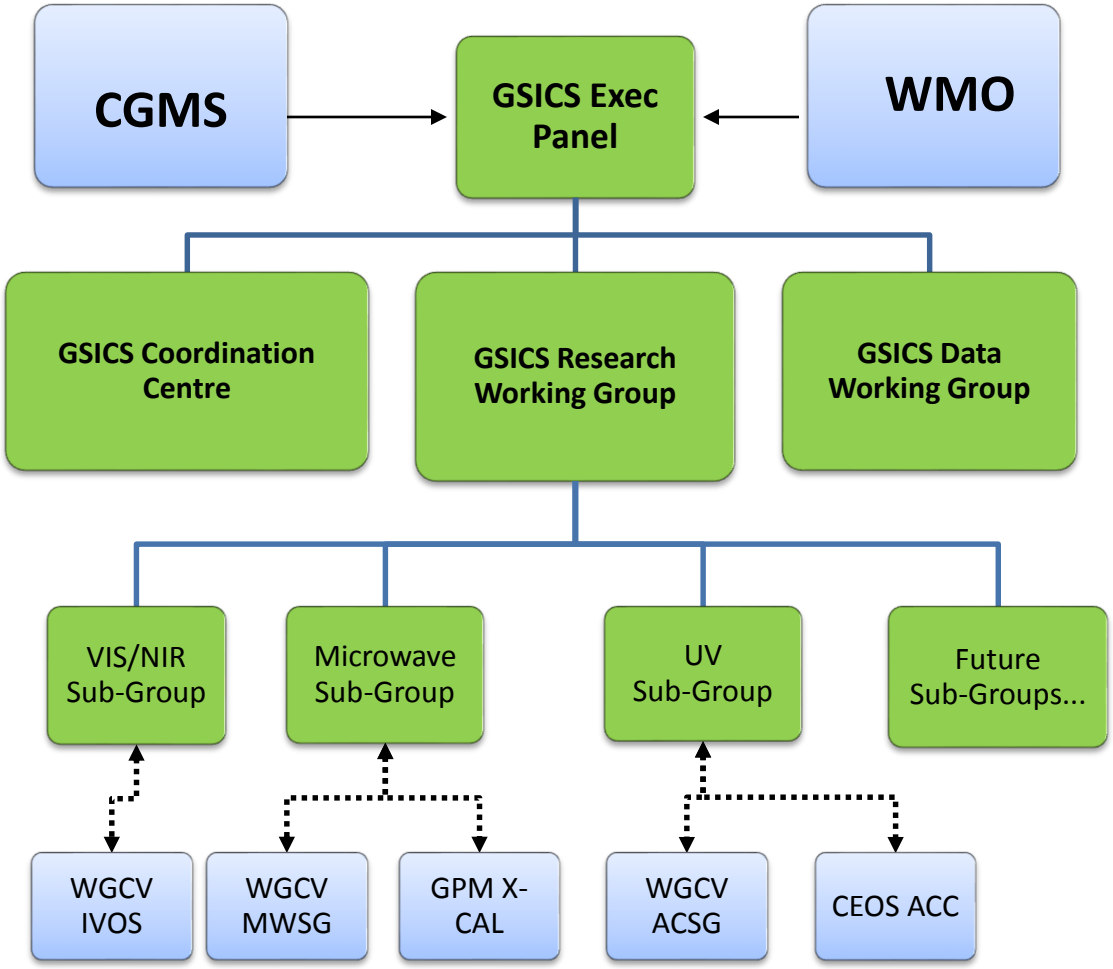
- Overview of GSICS, Structure, and Tools
- Status of the State of the Observing System Report
  - Action 45.05: GSICS to produce annual state of the observing system report to be delivered at CGMS
- Highlight some actions from EP-19
- HLPP

The aim of GSICS

- Satellite operators to provide satellite level 1 observations characterized using community endorsed references To provide adjustments, if needed, to enable consistent satellite observations.
- How? Using common tools, common vocabulary to assess fit for purpose of level 1 satellite observations, and provide adjustments when needed.
- GSICS provides the guidelines, tools, methodologies to assess fit for purpose and the adjustment procedures
- GSICS provides recommended web interfaces to allow user community to self monitor and communicate with GSICS Agency POCs.
- GSICS provides a state of the observing system report to the satellite community.



GSICS Structure & Partnerships



EUMETSAT
CNES
JMA
NOAA
CMA
KMA
ISRO
NASA
WMO
USGS
NIST
JAXA
ROSHYDROMET
IMD
ESA

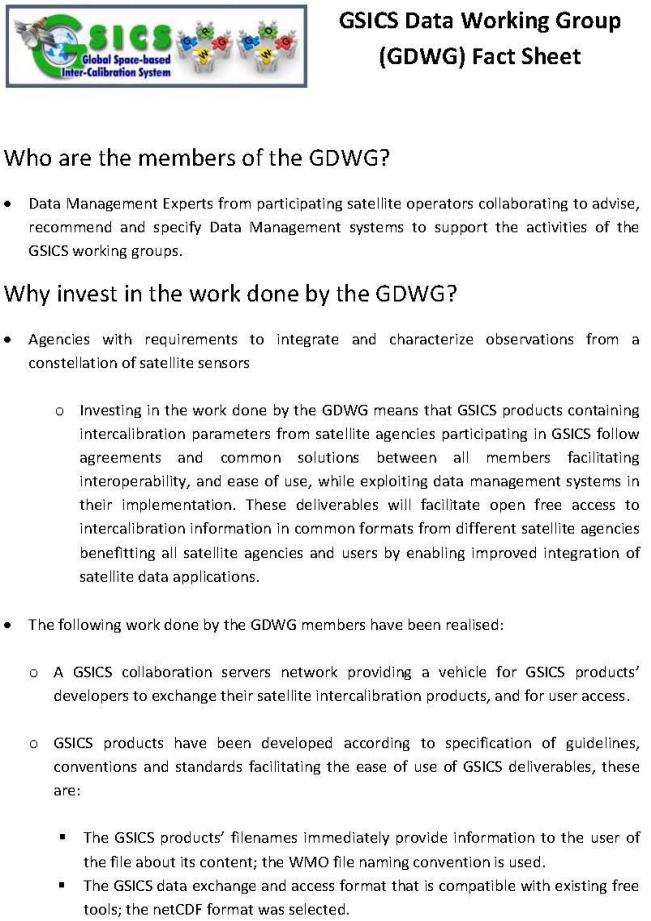
Development of Fact Sheets

Explains:

- Who
- Why
- What

Used for promoting activities Internally and for outreach.

Prepared for the various entities



GSICS Data Working Group (GDWG) Fact Sheet

Who are the members of the GDWG?

- Data Management Experts from participating satellite operators collaborating to advise, recommend and specify Data Management systems to support the activities of the GSICS working groups.

Why invest in the work done by the GDWG?

- Agencies with requirements to integrate and characterize observations from a constellation of satellite sensors
    - Investing in the work done by the GDWG means that GSICS products containing intercalibration parameters from satellite agencies participating in GSICS follow agreements and common solutions between all members facilitating interoperability, and ease of use, while exploiting data management systems in their implementation. These deliverables will facilitate open free access to intercalibration information in common formats from different satellite agencies benefitting all satellite agencies and users by enabling improved integration of satellite data applications.
- The following work done by the GDWG members have been realised:
    - A GSICS collaboration servers network providing a vehicle for GSICS products' developers to exchange their satellite intercalibration products, and for user access.
    - GSICS products have been developed according to specification of guidelines, conventions and standards facilitating the ease of use of GSICS deliverables, these are:
        - The GSICS products' filenames immediately provide information to the user of the file about its content; the WMO file naming convention is used.
        - The GSICS data exchange and access format that is compatible with existing free tools; the netCDF format was selected.

New Visualization Feature on GSICS Product Catalog - more than 50 products

https://www.star.nesdis.noaa.gov/smcd/GCC/ProductCatalogImages.php

Product Type	Algorithm Type	Data Producer	Maturity Level	Monitored Instrument	Reference Instrument	Version	Data Start Date	Data End Date	Docs / Data Links
Prime Re-analysis correction	GEO-LEO Prime IR							Present	Docs Data
Prime Re-analysis correction	GEO-LEO Prime IR							Present	Docs Data
Prime Re-analysis correction	GEO-LEO Prime IR							Present	Docs Data
Prime Re-analysis correction	GEO-LEO Prime IR							Present	Docs Data
Re-analysis Correction	GEO-LEO IR	EUMETSAT	Demonstration	MSG-1 SEVIRI	IASI-A	3	6/1/2008	Present	Docs Data
Re-analysis Correction	GEO-LEO IR							Present	Docs Data
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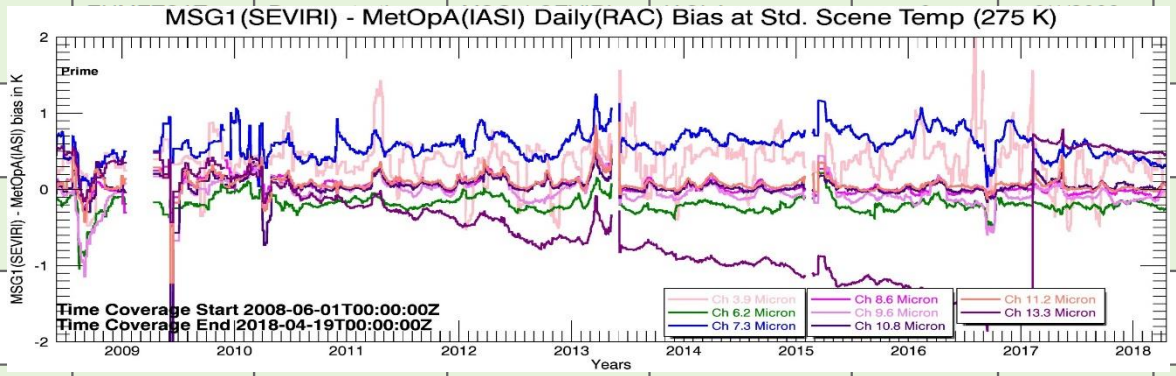
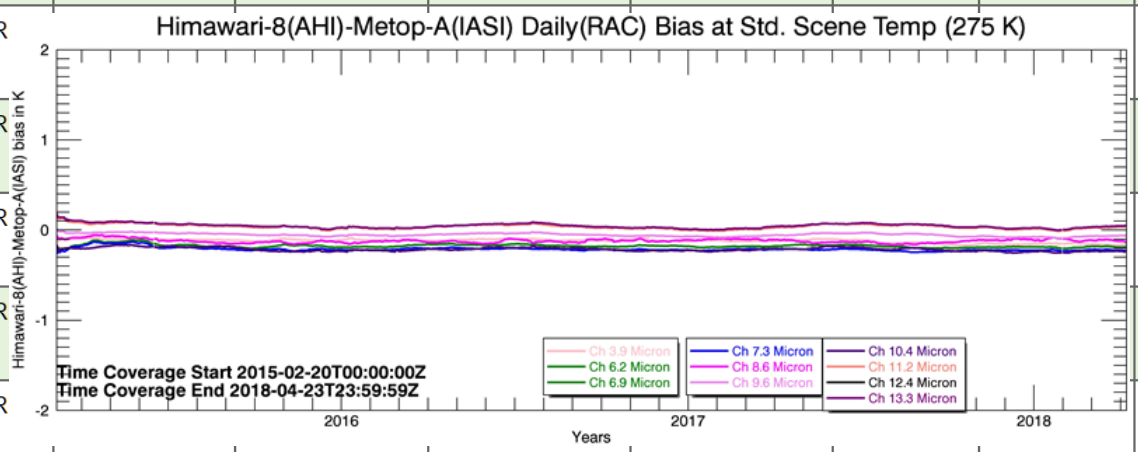
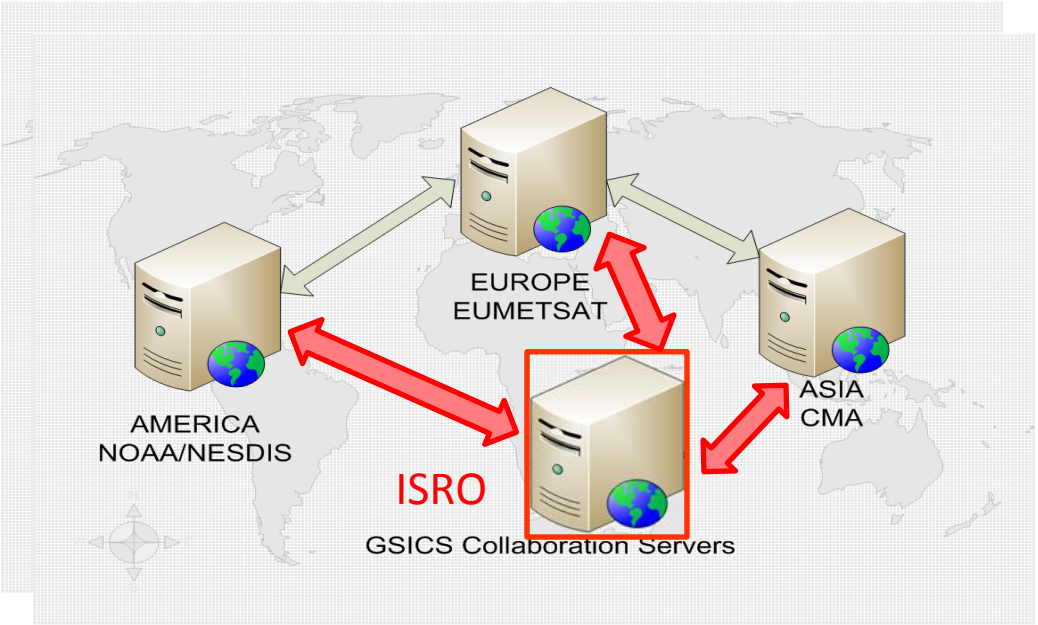




GSICS Collaboration Servers (THREDDS)

- Servers provide a set of services for GSICS user community to support data exchange and access to relevant inter-calibration products (all in NetCDF)
  - GSICS inter-calibration products
  - Source (e.g. L1 subset for monitored/reference instruments) for inter-calibration
  - Intermediate dataset (e.g. GEO-LEO collocation) for inter-calibration
- Mirroring products among the servers
  - Collaboration ongoing
- ISRO's new THREDDS server
  - Expected to be 4th GSICS Collaboration Server
  - Collaboration for update the server configuration ongoing



Public Facing Websites

GSICS Infrared Inter-calibration

Back

Himawari-8,9/AHI IR Inter-calibration with AIRS, IASI, and CrIS

GEO Data
- Himawari-8
- Himawari-9
  - Band07 (3.9 μm)
  - Band08 (6.2 μm)
  - Band09 (6.9 μm)
  - Band10 (7.3 μm)
  - Band11 (8.6 μm)
  - Band12 (9.6 μm)
  - Band13 (10.4 μm)
  - Band14 (11.2 μm)
  - Band15 (12.4 μm)
  - Band16 (13.3 μm)

LEO Data

Metop-A/IASI
all am pm

Metop-B/IASI
all am pm

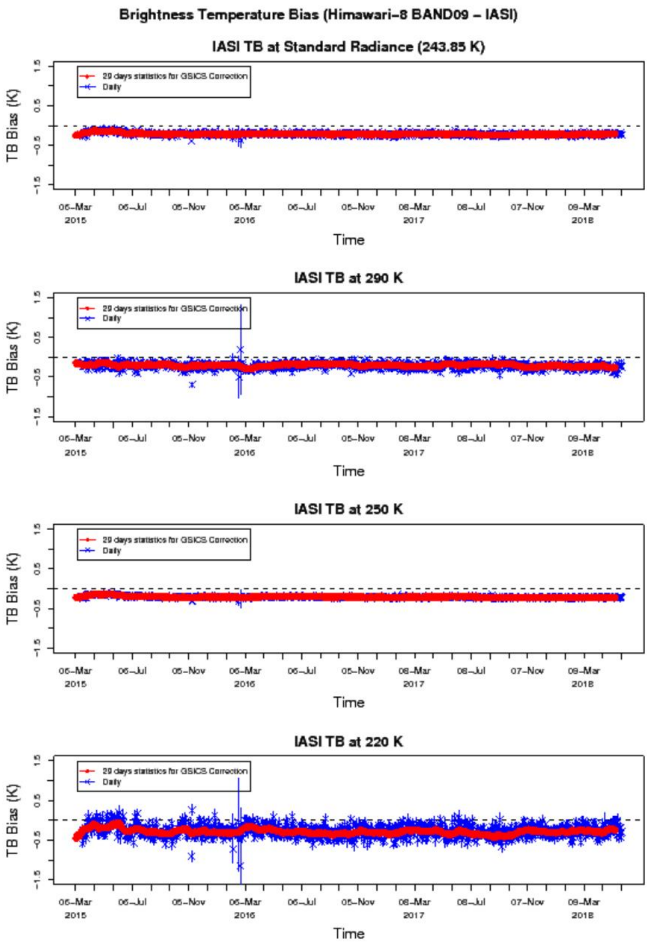
Aqua/AIRS
all am pm

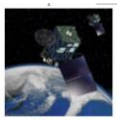
S-NPP/CrIS
all am pm

Time Series
- TB difference
- Regression coef.

Statistics for GSICS Correction
- Scatter plot

(Month Day Year)
Feb16, 2018
Feb17, 2018
Feb18, 2018
Feb19, 2018
Feb20, 2018
Feb21, 2018
Feb22, 2018
Feb23, 2018
Feb24, 2018





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LEO Data

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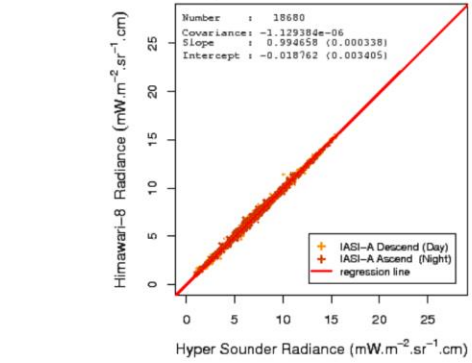
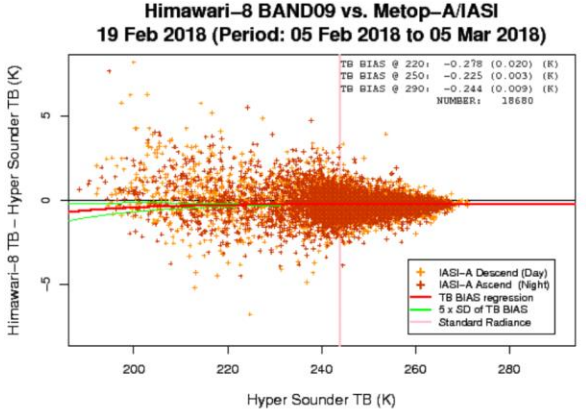


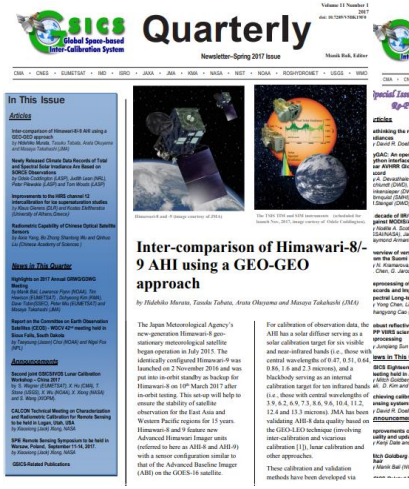


GSICS Activities-GSICS Newsletter

https://www.star.nesdis.noaa.gov/smcd/GCC/newsletters.php

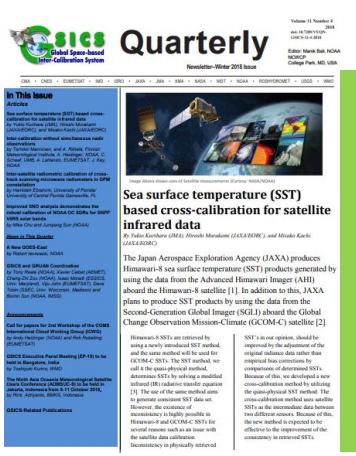
Over the last year, we published four New Issues of the GSICS Newsletter

- Over 22 Research Articles, 15 Topics of News to which
- Nearly 70 Scientists contributed as Authors & Co-Authors.
- Reviewed contemporary journal policy on content sharing.
- Contributions from non GSICS members has increased.
- Next issue (Spring 2018) of the Newsletter is a special Issue on Russian Cal/Val.


Quarterly
Newsletter–Spring 2017 Issue
In This Issue
Inter-comparison of Himawari-8/-9 AHI using a GEO-GEO approach


Quarterly
Newsletter–Summer 2017 Issue
Rethinking the release of imager calibrated radiances


Quarterly
Newsletter–Fall 2017 Issue
JPSS-1, FY-3D and Sentinel-5P launched


Quarterly
Newsletter–Winter 2018 Issue
Sea surface temperature (SST) based cross-calibration for satellite infrared data

News Letter included in SCOPUS and extensively cited by agencies and friends of GSICS (google scholar, twitter facebook).

2017 GSICS Session in AOMSUC-8 Vladivostok, Russia

The AOMSUC-8 was attended by 175 representatives of national meteorological services, space agencies, and other ministries and agencies from 27 countries.
The GSICS Session was split into Oral and Poster session which gave a platform for Asian and Russian CAL/VAL scientists to present their work and exchange ideas on inter-calibration

The following were among the key take-away messages:

(1) GSICS algorithms and GSICS references (such as CrIS, IASI and L1 Microwave MSU/AMSU FCDR) have helped monitor and re-calibrate Russian Instruments such as IKFS-2, MTVZA-GY, MSU-GS

(2) GSICS has begun playing a key role in enhancing collaboration with AOMSUC members. This was visible from range of inter-calibration talks and posters given by agencies in the Asian region such as KMA, JMA, IMD and CMA that used GSICS best practices and algorithms for monitoring instruments.

(3) GSICS members have been encouraged to participate in future AOMSUC training sessions and impart knowledge on using GSICS techniques.

The complete agenda with links to the talks is available at http://aomsuc8.ntsomz.ru/wp-content/uploads/2017/10/AOMSUC-8_Agenda_conference_v6.pdf

- **Monday**: Measurements and Moon Observations (chaired by X. Hu - CMA)
- **Tuesday:** Using the ROLO and the GIRO and Lunar Model Developments (chaired by T. Stone - USGS)
- **Wednesday:** Inter-calibration and Inter-band Calibration (chaired by S. Wagner - EUMETSAT) and Alternative uses of lunar measurements (MTF post-launch characterisation, chaired by F. Yu - NOAA)
- **Thursday**: Alternative uses of lunar measurements (ghost, cross-talk, infrared, microwave, etc. – chaired by X. Xiong - NASA) and Discussions, Review of actions/recommendation/way forward and Conclusions of the workshop (chaired by S. Wagner - EUMETSAT).

2018 Annual GRWG/GDWG meeting
March 19-23, Shanghai, China

GSICS Annual State of the Observing System

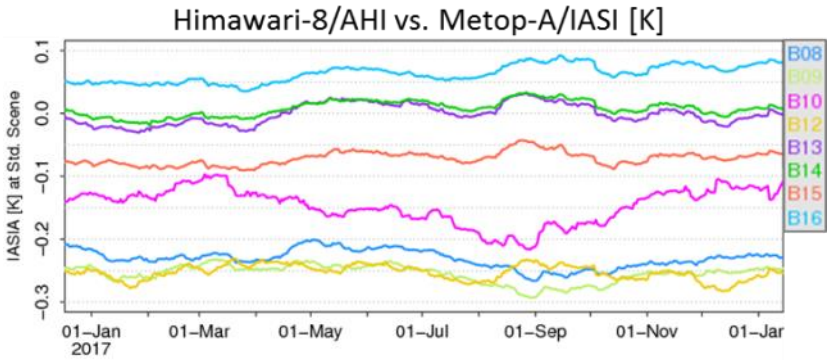
Can we compile a collection of GSICS monitoring results into overarching annual assessment of observing system performance with respect to reference instruments?

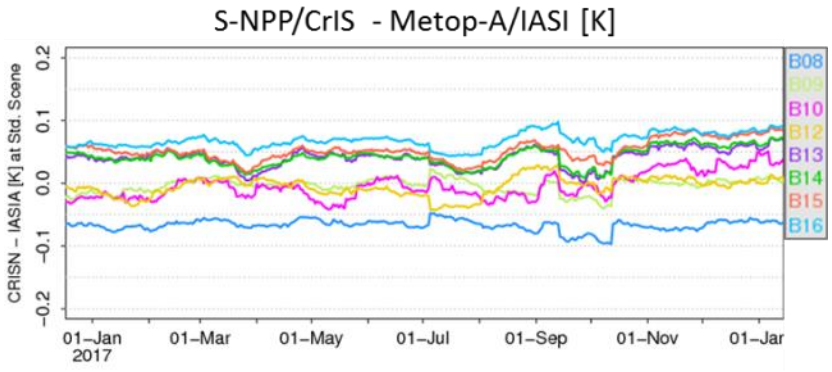
Calibration Performance: Himawari-8/AHI Infrared Bands

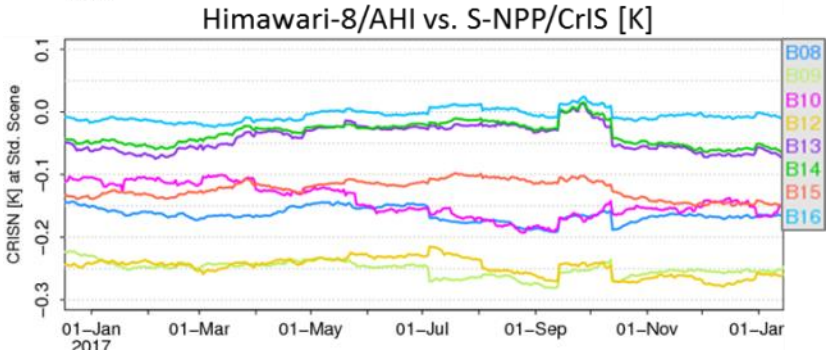
Summary Statistics of Himawari-8/AHI IR Calibration Performance in 2017 (All uncertainties are k=1)

	Channel Name (Central Wavelength in μm)	BAND07 (3.9)	BAND08 (6.2)	BAND09 (6.9)	BAND10 (7.3)	BAND11 (8.6)	BAND12 (9.6)	BAND13 (10.4)	BAND14 (11.2)	BAND15 (12.4)	BAND16 (13.3)
	Std. Radiance as Tb (K)	286.0	234.6	243.9	254.6	283.8	259.5	286.2	286.1	283.8	269.7
Metop-A/ IASI	Mean Bias (K)	-0.11	-0.173	-0.212	-0.129	-0.05	-0.216	0.036	0.045	-0.04	0.078
	Stdv. of Bias (K)	0.008	0.012	0.009	0.014	0.012	0.017	0.018	0.019	0.017	0.015
S-NPP/ CrIS	Mean Bias (K)	-0.07	-0.16	-0.24	-0.15	N/A	-0.23	-0.02	-0.01	-0.01	0.03
	Stdv/ of Bias (K)	0.039	0.011	0.012	0.026	N/A	0.013	0.013	0.012	0.010	0.005

- The statistics are derived from Himawari-8/AHI GSICS Re-Analysis Correction (ATBD)
- Standard Radiance: typical scene defined by GSICS for easy inter-comparison of sensors' inter-calibration biases







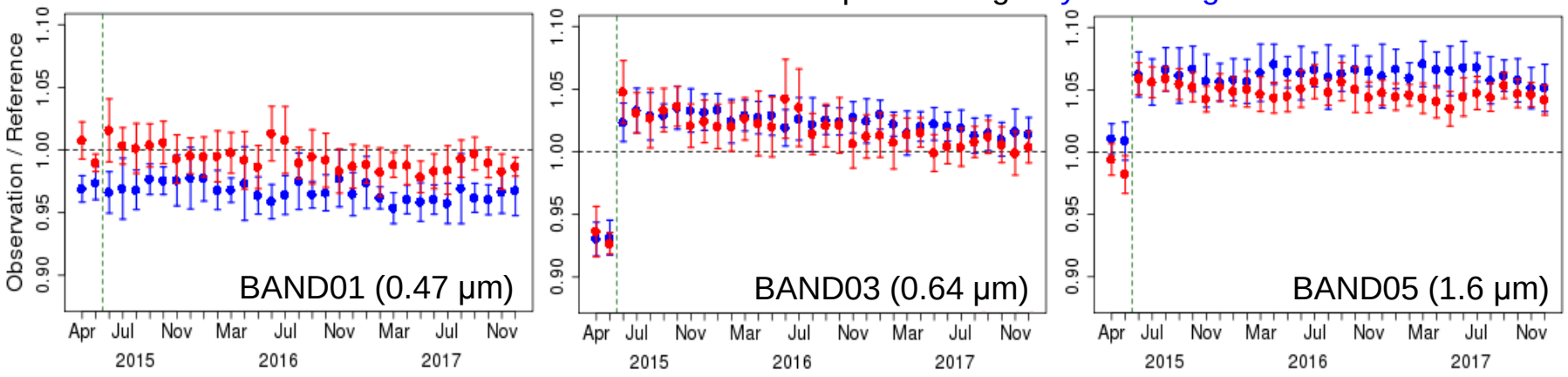
Calibration Performance: Himawari-8/AHI Visible/Near-Infrared Bands

Summary Statistics of Himawari-8/AHI VNIR Calibration Performance (All Uncertainties are k=1)

Channel Name (Central Wavelength in μm)		BAND01 (0.47)	BAND02 (0.51)	BAND03 (0.64)	BAND04 (0.86)	BAND05 (1.6)	BAND06 (2.3)	Units
Ray-matching w/ S-NPP/VIIRS	Mean Bias	2.2 ± 0.8	+3.1 ± 0.8	-2.9 ± 0.8	-0.8 ± 0.7	-6.3 ± 0.8	+4.9 ± 0.9	%
	Annual Drift	-0.53 ± 0.15	-0.52 ± 0.12	-0.79 ± 0.09	-0.58 ± 0.06	-0.06 ± 0.13	-0.18 ± 0.11	%/yr
Vicarious Cal. using Aqua/MODIS + RTM	Mean Bias	1.0 ± 1.6	+1.7 ± 1.8	-1.9 ± 1.8	-2.8 ± 1.6	-4.3 ± 1.0	+3.5 ± 0.9	%
	Annual Drift	-0.72 ± 0.17	-0.92 ± 0.18	-1.26 ± 0.17	-1.20 ± 0.17	-0.39 ± 0.12	-0.24 ± 0.19	%/yr

- Mean Bias: monthly average and standard deviation of the daily results in January 2017
- Annual Drift: calculated using Mean Bias from July 2015 to December 2017
- Ray-matching: Spectral Band Adjustment Factors on NASA Langley website compensates Spectral diff. (ATBD)
- Vicarious calibration uses optical parameters retrieved from Aqua/MODIS C6 L1B (Reference)

Trend of the ratio of observation to reference computed using Ray-matching / Vicarious



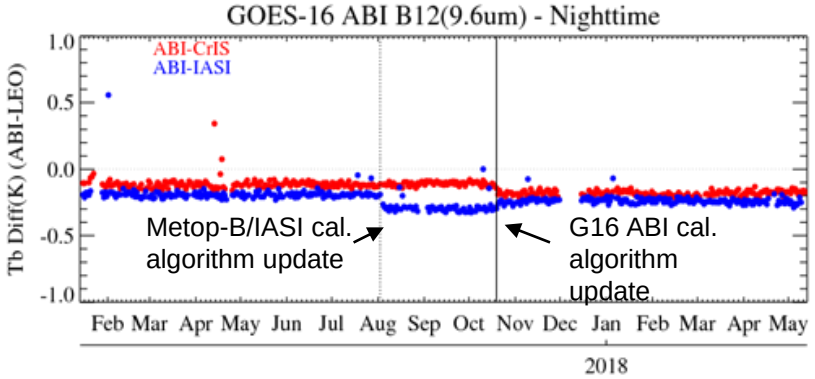
Calibration Performance: GOES16/ABI Infrared Bands

Summary Statistics of GOES-16/ABI IR Calibration Performance in December 2017 (All uncertainties are k=1)

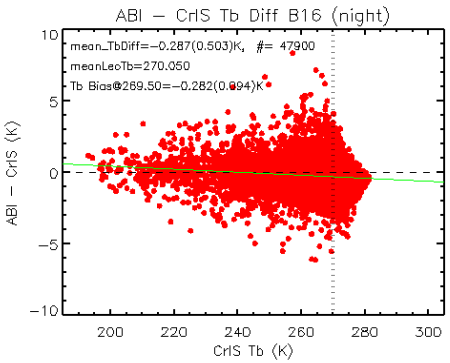
	Channel Name (Central Wavelength in μm)	BAND07 (3.9)	BAND08 (6.2)	BAND09 (6.9)	BAND10 (7.3)	BAND11 (8.6)	BAND12 (9.6)	BAND13 (10.4)	BAND14 (11.2)	BAND15 (12.4)	BAND16 (13.3)
	Std. Scene Tb (K)	286.0	234.5	244.0	254.5	284.0	259.5	286.0	286.0	283.5	269.5
Metop-B/ IASI	Bias at Std. Scene(K)	-0.167	-0.196	-0.218	-0.170	-0.204	-0.227	-0.210	-0.141	-0.153	-0.294
	Stdv. of Bias (K)	0.120	0.082	0.093	0.108	0.147	0.110	0.160	0.165	0.169	0.160
S-NPP/ CrIS	Bias at Std. Scene(K)	-	-	-0.259	-0.202	-	-0.160	-0.227	-0.167	-0.176	-0.282
	Stdv of Bias (K)	-	-	0.045	0.052	-	0.047	0.073	0.073	0.073	0.094

- The uncertainty and statistics are calculated following the GSICS standard GEO-LEO IR inter-calibration algorithm
- GOES-16 ABI IR calibration is very stable with mean Tb bias to CrIS/IASI less than 0.3K. No significant scene dependent Tb bias to the reference instruments for all the IR channels
- GOES-16 ABI post-launch test started in Jan. 2017 and became operational on 18 December 2017. L1B data are available to the public since after the provisional maturity on 1 June 2017.
- Stable reference and monitored instruments can quickly detect and identify calibration events (e.g. Metop-B/IASI and GOES-16 ABI Ground updates) and validate the algorithm (e.g. ABI cal. algorithm update in October 2017)

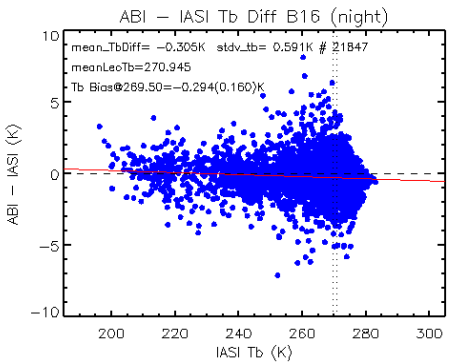
Time series of GOES-16 ABI daily mean Tb bias to SNPP/CrIS and Metop-B/IASI for ABI B12



Scene dependent Tb bias to SNPP/CrIS for ABI B16



Scene dependent Tb bias to Metop-B/IASI for ABI B16



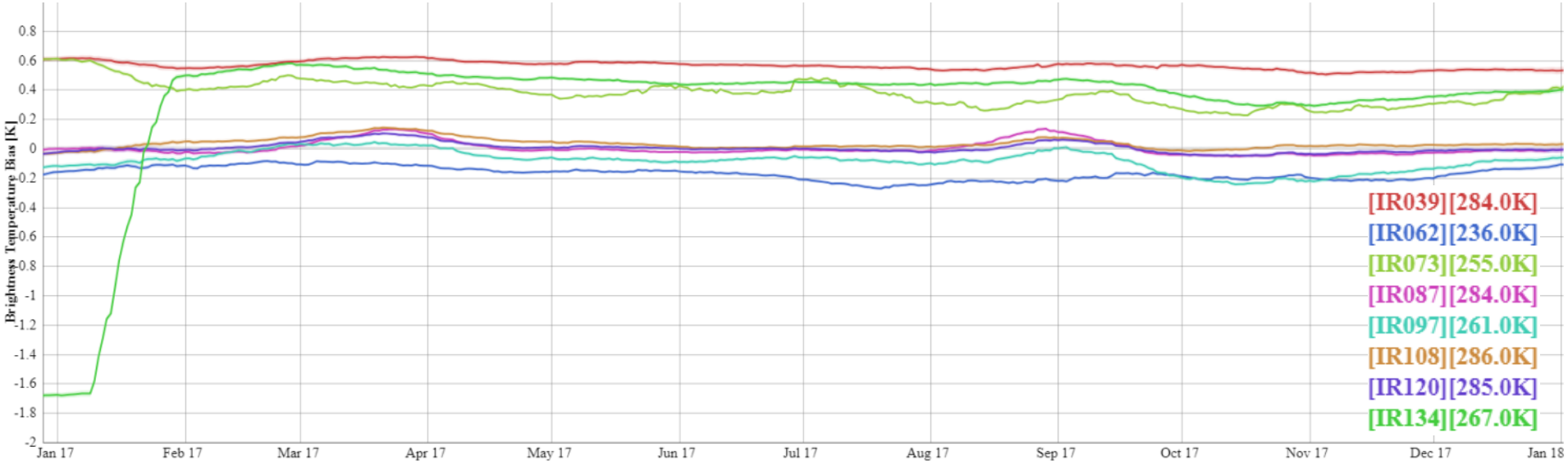
Calibration Performance: Meteosat-8/SEVIRI IR Bands

Summary Statistics of Meteosat-8/SEVIRI IR Calibration Performance in 2017 (All uncertainties are k=1)

Channel Name	IR3.9	IR6.2	IR7.3	IR8.7	IR9.7	IR10.8	IR12.0	IR13.4
Standard Radiance as Tb (K)	284	236	255	284	261	286	285	267
Mean Bias (K)	+0.57	-0.16	+0.38	+0.01	-0.08	+0.04	+0.01	+0.35
Standard Deviation of Bias (K)	0.03	0.05	0.08	0.05	0.07	0.04	0.03	0.40
Mean Drift Rate of Bias (K/yr)	-0.07	-0.10	-0.22	-0.04	-0.14	-0.05	-0.05	+0.35

- The statistics are derived from Meteosat-8/SEVIRI Operational GSICS Re-Analysis Correction vs. Metop-A/IASI
- Biases defined for Standard Radiance: typical scene for easy inter-comparison of sensors' inter-calibration biases
- Decontaminations introduce calibration jumps – most obvious in the IR13.4 channel due to ice contamination

Time series of Meteosat-8/SEVIRI Tb biases w.r.t. Metop-A/IASI at standard radiance



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Summary Statistics of Meteosat-9/SEVIRI IR Calibration Performance in 2017 (All uncertainties are k=1)

Channel Name	IR3.9	IR6.2	IR7.3	IR8.7	IR9.7	IR10.8	IR12.0	IR13.4
Standard Radiance as Tb (K)	284	236	255	284	261	286	285	267
Mean Bias (K)	+0.36	-0.13	+0.09	+0.01	-0.03	+0.03	-0.01	-1.41
Standard Deviation of Bias (K)	0.08	0.12	0.15	0.11	0.18	0.11	0.13	0.16
Mean Drift Rate of Bias (K/yr)	-0.23	-0.34	-0.39	-0.08	-0.44	-0.13	-0.21	-0.46

- The statistics are derived from Meteosat-9/SEVIRI Operational GSICS Re-Analysis Correction vs. Metop-A/IASI
- Biases defined for Standard Radiance: typical scene for easy inter-comparison of sensors' inter-calibration biases
- Meteosat-9 operated in Rapid Scan Service during most of this period, which increases the bias uncertainties

Time series of Meteosat-9/SEVIRI Tb biases w.r.t. Metop-A/IASI at standard radiance

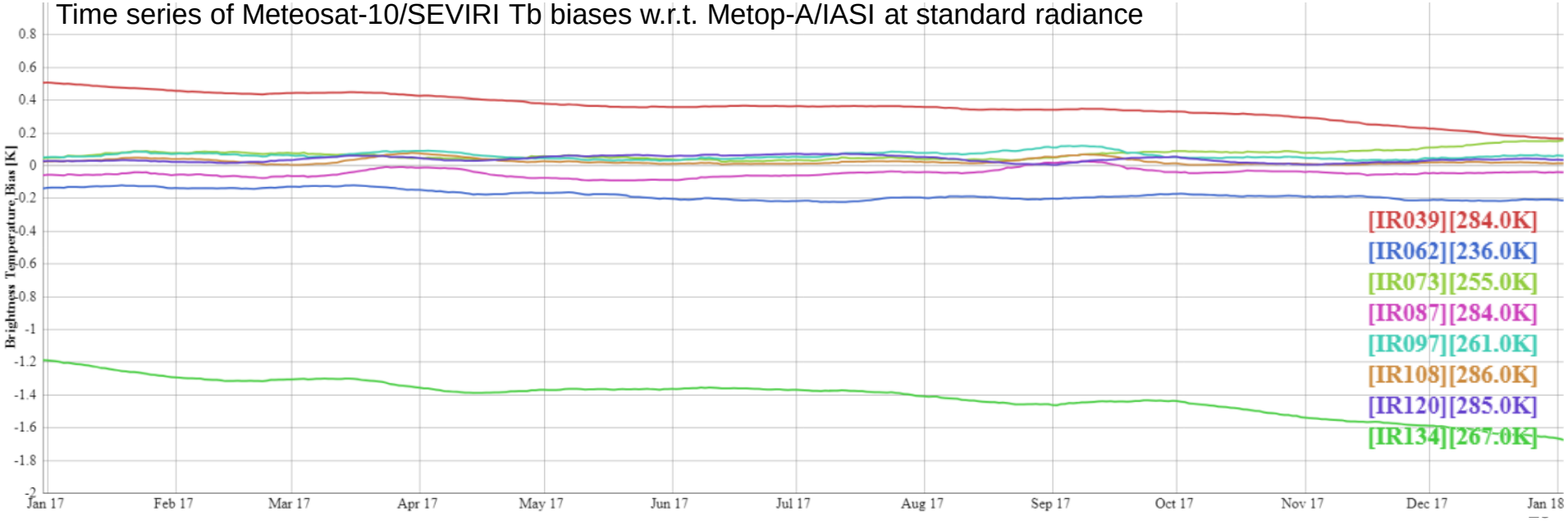
Calibration Performance: Meteosat-10/SEVIRI IR Bands

Summary Statistics of Meteosat-10/SEVIRI IR Calibration Performance in 2017 (All uncertainties are k=1)

Channel Name	IR3.9	IR6.2	IR7.3	IR8.7	IR9.7	IR10.8	IR12.0	IR13.4
Standard Radiance as Tb (K)	284	236	255	284	261	286	285	267
Mean Bias (K)	+0.36	-0.17	+0.07	-0.04	+0.07	+0.03	+0.04	-1.40
Standard Deviation of Bias (K)	0.08	0.03	0.03	0.03	0.02	0.02	0.02	0.11
Mean Drift Rate of Bias (K/yr)	-0.25	-0.08	+0.05	+0.03	-0.01	-0.02	-0.01	-0.35

- The statistics are derived from Meteosat-10/SEVIRI Operational GSICS Re-Analysis Correction vs. Metop-A/IASI
- Biases defined for Standard Radiance: typical scene for easy inter-comparison of sensors' inter-calibration biases
- Decontaminations introduce calibration jumps – most obvious in the IR13.4 channel due to ice contamination

Time series of Meteosat-10/SEVIRI Tb biases w.r.t. Metop-A/IASI at standard radiance

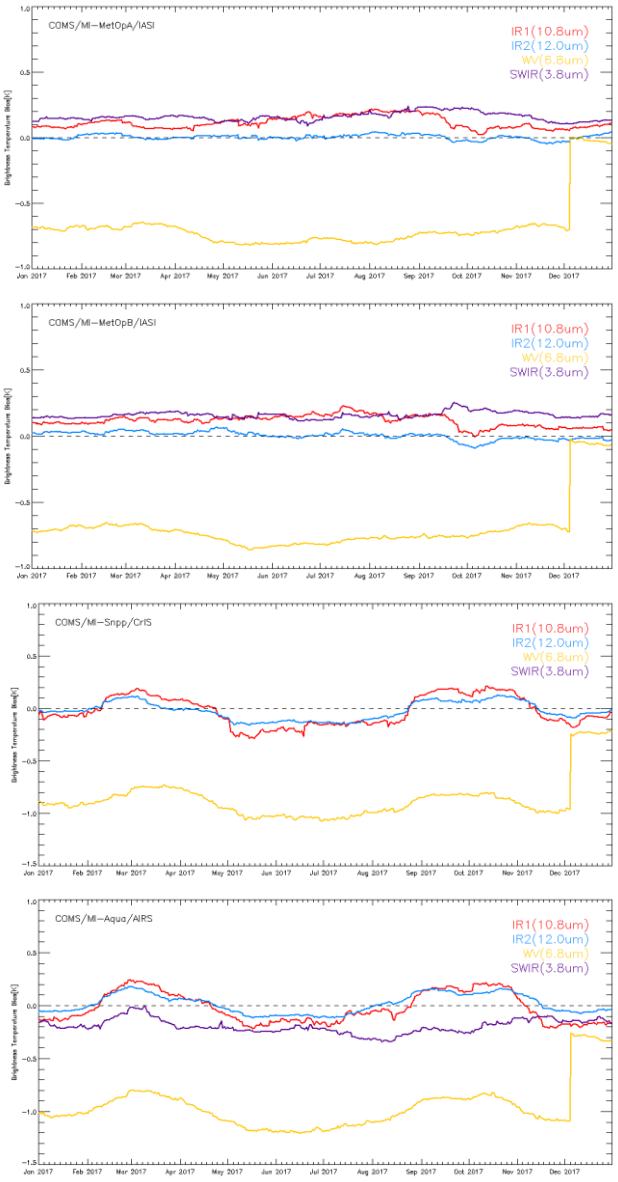


Calibration Performance: COMS/MI Infrared Bands

Summary Statistics of COMS/MI IR Calibration Performance in 2017 (All uncertainties are k=1)

	MetOp-A/IASI				MetOp-B/IASI			
Channel Name	IR3.8	IR6.8	IR10.8	IR12.0	IR3.8	IR6.8	IR10.8	IR12.0
Std Rad as Tb (K)	286	238	286	285	286	238	286	285
Mean Bias (K)	0.16	-0.02	0.12	0.004	0.15	-0.06	0.11	0.004
Stdv of Bias (K)	0.03	0.01	0.05	0.02	0.02	0.01	0.04	0.03
Mean Drift Rate of Bias (K/yr)	-0.14	-	-0.12	-0.01	-0.15	-	-0.14	-0.04

	Snpp/CrIS				Aqua/AIRS			
Channel Name	IR3.8	IR6.8	IR10.8	IR12.0	IR3.8	IR6.8	IR10.8	IR12.0
Std Rad as Tb (K)	286	238	286	285	286	238	286	285
Mean Bias (K)	-	-0.23	-0.03	-0.02	-0.19	-0.30	-0.02	0.02
Stdv of Bias (K)	-	0.01	0.14	0.08	0.07	0.02	0.14	0.09
Mean Drift Rate of Bias (K/yr)	-	-	+0.03	+0.03	+0.19	-	-0.005	-0.007



- The statistics are derived from COMS/MI Operational GSICS Re-Analysis Correction vs. Metop-A/IASI, Metop-B/IASI, Aqua/AIRS, Snpp/CrIS
- Biases defined for Standard Radiance: typical scene for easy inter-comparison of sensors' inter-calibration biases
- Operation of MI with shifted WV SRF of 3.5cm^{-1} started in 5 December 2017.

ISRO GSICS Plotting Tool (INSAT-3D)

GSICS CALIBRATION MONITORING SYSTEM FOR INSAT-3D

HOME | GSICS | OTHER LINKS | MUNNVINAYAK

Satellite: INSAT-3D
Sensor: IMAGER
Reference Satellite: MetOpA
Reference Sensor: IASI
Start Date: 01-Feb-2016
End Date: 30-May-2018
Time Of Pass: 00:00:00 GMT
Version 2(Latest Version)
Channels: MIR, WVP, TIR-1, TIR-2
Parameter: Standard Scene BT Bias

Alert Flag | Draw Chart
Alert Description

— Standard Scene BT Bias(MIR) — Standard Scene BT Bias(WVP) — Standard Scene BT Bias(TIR-1) — Standard Scene BT Bias(TIR-2)

Statistics | Fill Value | Generate Files

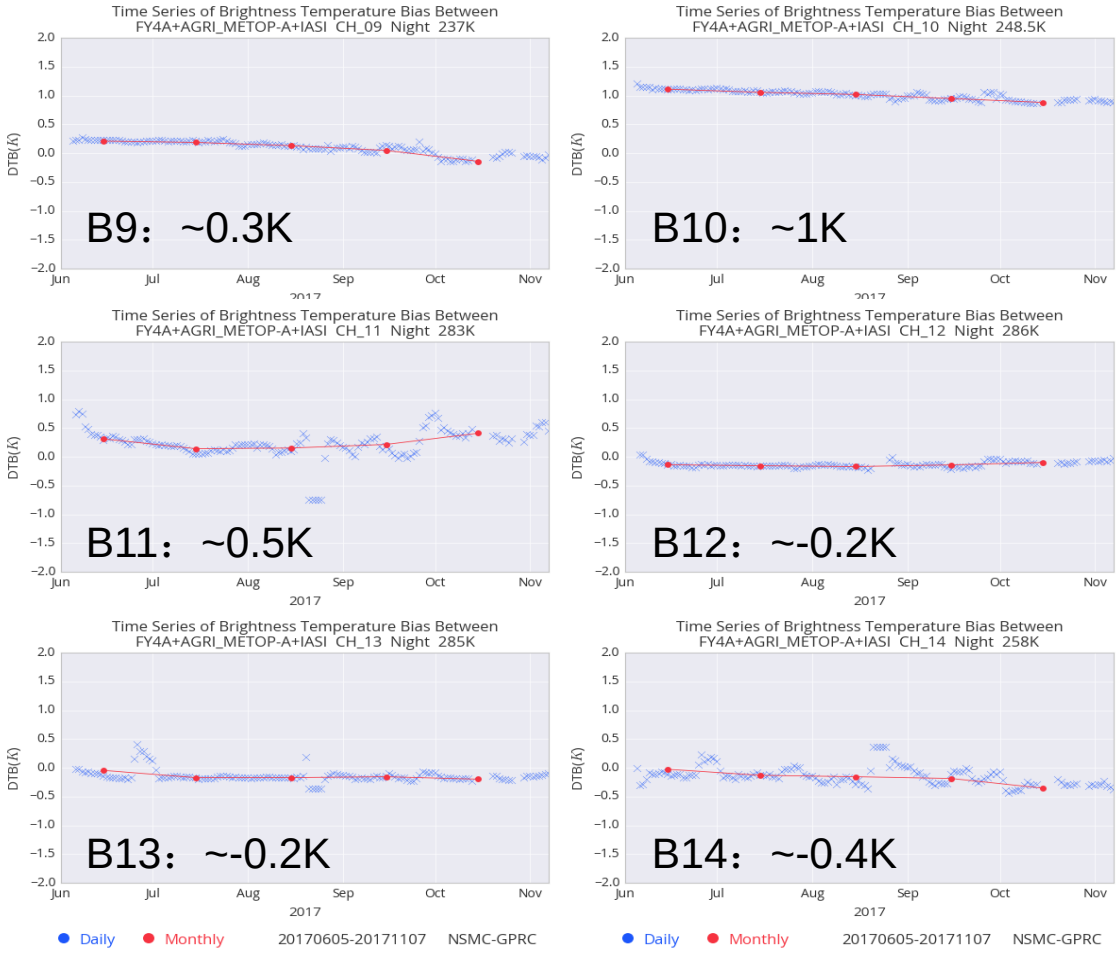
			Overall Statistics				Temporal Statistics (Window Period = 15 Days)			
Version No.	Channel	Parameter	Min	Max	Mean	Standard Deviation	Min	Max	Mean	Standard Deviation
2	MIR	Standard Scene BT Bias(K)	-0.8676	2.2223	0.1466	0.4638	0.4509	0.6603	0.5921	0.0586
2	WVP	Standard Scene BT Bias(K)	-1.3916	1.9744	-0.2044	0.6914	-0.4617	-0.1806	-0.2810	0.0849
2	TIR-1	Standard Scene BT Bias(K)	-0.0726	1.6424	0.6178	0.3024	0.2892	0.5681	0.4672	0.0959

OTHER LINKS :
- i3dQAS
- MOSDAC
- GSICS(MOSDAC)
- AAKASH
- SAC Mail

CONTACT US :
Image Analysis & Quality Evaluation Division (IAQD/SIPG)
Signal & Image Processing Group
Space Applications Centre, ISRO
Extension : 4716/4797

ABOUT US :
Responsible to evaluate quality of data by use of image analysis techniques and provide feedback to payload, data products & mission teams.

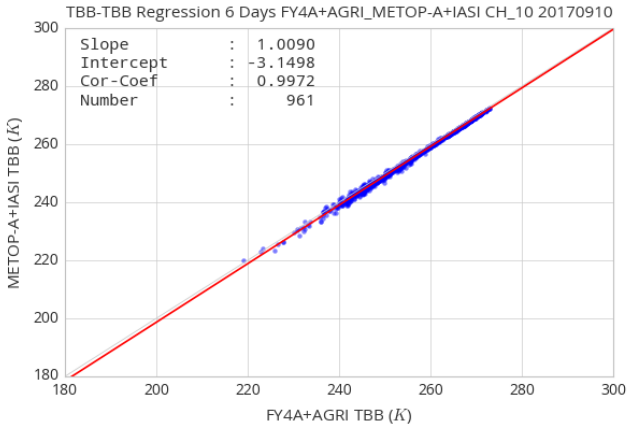
FY-4 AGRI IR bias compared with IASI



IR band Bias Monitoring @290K

IR bands (3.8um not included)

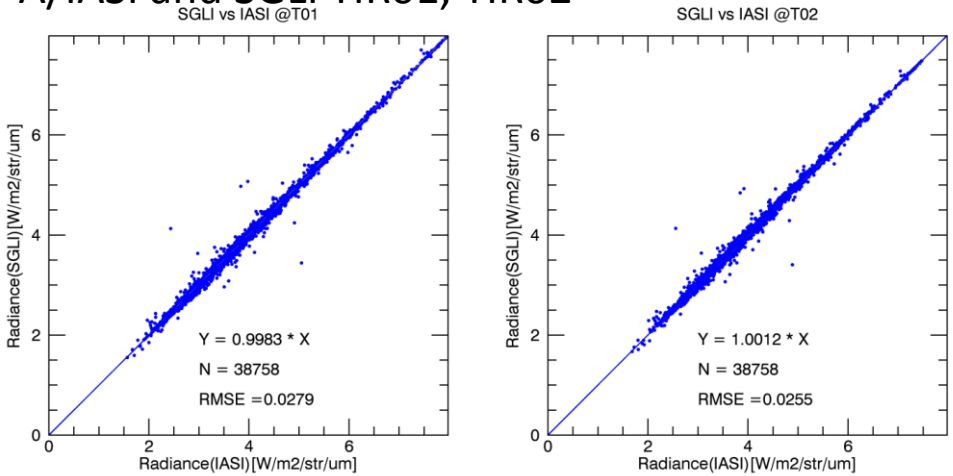
- **Band 10 has 1.0 K higher than IASI ;**
- **Less than 0.5K at other IR bands**



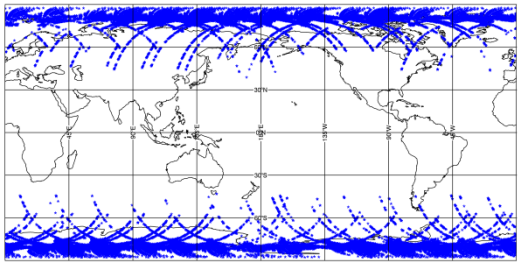
(Courtesy of Na Xu et al. , 2018)

JAXA: Cross calibration of SGLI thermal infrared bands with satellite sounders

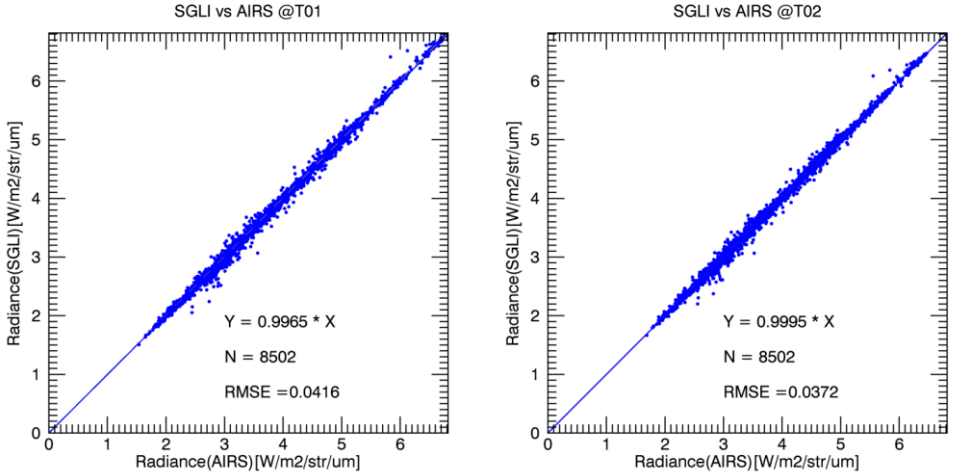
MetOp-A/IASI and SGLI TIR01, TIR02



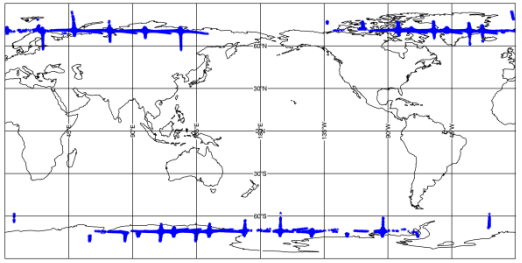
Match-ups in 29-31 Jan 2018



Aqua/AIRS and SGLI TIR01, TIR02

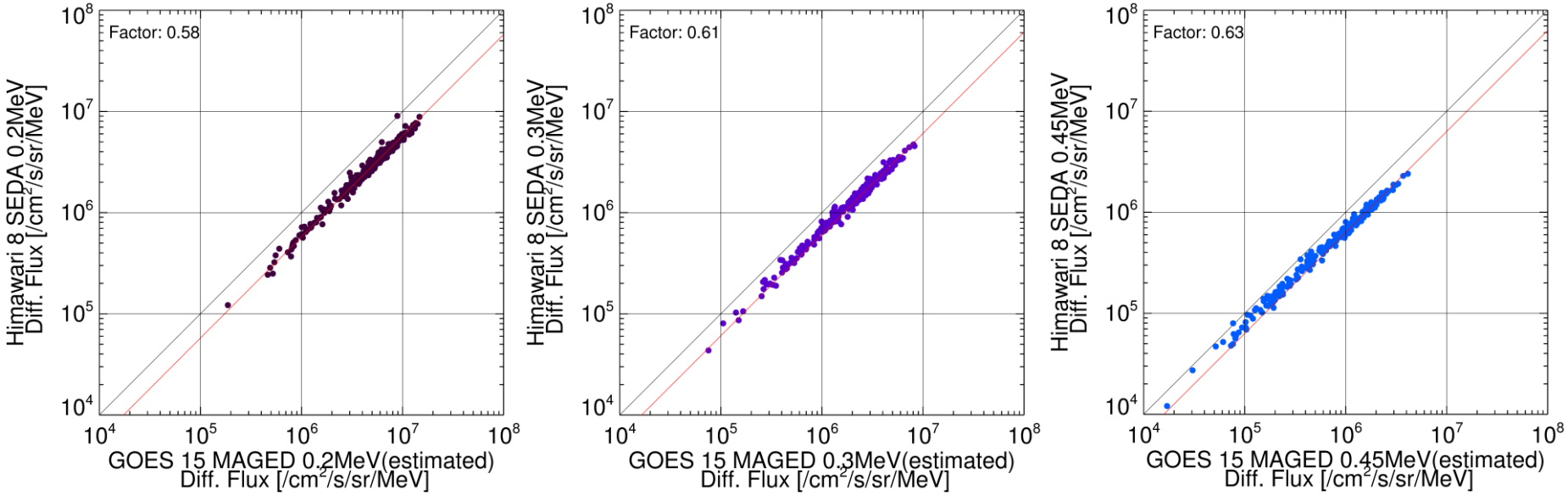


Match-ups in 31 Jan – 10 Feb 2018



Coordination with Space Weather

Inter-calibration between Himawari-8/SEDA and GOES 15 particle detector



There are good correlations between Himawari-8 and GOES 15 observations in general. However, the flux level is slightly lower than that observed by GOES 15 in these channels.

Reference	Action Description	Actionee	Due date
A.GEP.20180601.1	EP chair to recommend the nomination of GRWG membership from CNES	EP Chair	EP-20
A.KMA.20180601.2	KMA to provide the inter-calibration comparison results of COMS/MI using before and after reprocessed CrIS data	KMA	EP-20
A.GRWG.20180601.3	GRWG to develop a strategy, including the procedure and criteria, on how to handle the long-term drifts of individual instruments identified based on the analyses using GSICS approved approaches. This applies primarily to the VIS/NIR instruments.	GRWG Chair	EP-20
A.GCC&ISRO.20180601.4	GCC to develop harmonized interface for the instrument performance monitoring website as a baseline for inquiring instrument status. Demo by ISRO	GCC/ISRO	EP-20
A.GRWG.20180601.5	GRWG to develop monitoring webpage to demonstrate instrument performance recalibrated after applying the GSICS correction	GRWG	EP-20
A.GEP.20180601.6	EP Chair to request ESA to become full member of GSICS	EP	EP-20
A.WMO.20180601.7-1	WMO to provide information on WMO cloud to NOAA-GDWG. Information sough includes (Ability to upload GSICS products onto the WMO Cloud by members, Ability to download data, Disk Space available and Redundancy)	WMO	August 2018
A.NOAA&GDWG.20180601.7-2	Following above action, NOAA-GDWG to provide information on Clouds available at NOAA and whether they can be used to host GSICS data from member agencies.	NOAA-GDWG	Dec 2018

A.GCC.20180601.8	GCC to contact GRUAN POC in GSICS (Tony/Ralph/Cheng-Zhi) to submit yearly updates on 3G (GRUAN-GSICS-GNSS) collaboration to EP	GCC	EP-20
A.ISRO&GCC.20180601.9	ISRO to contact GCC to obtain knowledge on reading CrIS data to help them inter-calibrate INSAT with CrIS.	ISRO	EP-20
A.GCC.20180601.10	GCC to simplify and stream line GPPA checklist and share it with members to fast track maturity; Start with KMA and JMA.	GCC	EP-20
A.GCC.20180601.11	GCC to provide recommendations on new processing and science maturity levels for GSICS products and services	GCC	EP-20
A.GEP&GCC&GRWG&GDWG.20180601.12	Encourage submission of papers on GSICS in Joint NOAA EUMETSAT Conference to be organized around Oct 2019 in Boston, USA	EP/GCC/GRWG/GDWG	EP-20
A.GCC&GRWG.20180601.13	GCC/GRWG to develop consensus on contents of intermediate collocation products to be shared with users	GCC/GRWG	EP-20
A.GPRC.20180601.14	GSICS Agencies to include CrIS in their GEO-LEO monitoring	GPRC	EP-20
A.GEP.20180601.15	EP to consider how to involve space weather in sub-group	EP	CGMS-46
A.GRWG.20180601.16	GRWG to review and update the GSICS document "**Guide to GSICS Products and Services**" to be referred in the WMO document "Guide to the WMO Integrated Global Observing System (Guide to WIGOS)"	GRWG	EP-20
A.GRWG.20180601.17	GRWG to review and update the WMO CIMO Guide: **PART III: SPACE-BASED OBSERVATIONS Chapter 6: Calibration and validation** for emphasizing contribution of GSICS to space-based observation	GRWG	August 2018
A.GRWG.20180601.18	GRWG to develop plan for side-events in CGMS Science Working Group meetings	GRWG	EP-20

Key issues of relevance to CGMS:

HLPP (No new entries):

3.1 Establish a fully consistent calibration of relevant satellite instruments across CGMS agencies, recognising the importance of collaboration between operational and research CGMS agencies

3.1.1 Establish within GSICS a consistent inter-calibration for thermal IR channels using hyper-spectral sounders as reference. The implementation will be done successively by the individual satellite operators; ✓

3.1.2 Establish within GSICS a consistent inter-calibration for solar channels using instruments with adequate in-orbit calibration and vicarious methods as reference. The implementation will be done successively by the individual satellite operators; ✓

5.2 Space Weather:

5.2.2 Investigate feasibility of a consistent inter-calibration for energetic particle measurements using instruments with adequate in-orbit calibration and vicarious methods, using GSICS methodology as reference. ✓

Thanks for your attention!