

GLOBAL SPACE-BASED INTERCALIBRATION SYSTEM

EXECUTIVE PANEL, NINTH SESSION

NEW DELHI, INDIA, 12 NOVEMBER 2010

FINAL REPORT

1. OPENING OF THE SESSION

The ninth session of the Global Space-based Inter-Calibration System (GSICS) was held in New-Delhi following the closure of the 38th session of the Coordination Group for Meteorological Satellites (CGMS).

In opening the meeting, the Chairman indicated that, taking advantage of the collocation with CGMS, representatives from IMD, ISRO, ROSHYDROMET and WMO were invited to attend as observers in addition to the Executive Panel members. He welcomed all participants to the meeting and welcomed the involvement of a growing number of agencies in GSICS. The list of participants is contained in Annex 1.

The agenda was adopted as contained in Annex 2. It was recalled that, as agreed at the last session, this meeting would mainly focus on an intermediate status of actions. The next meeting, to be held in the middle of 2011, would be the opportunity for more thorough discussions on strategic issues and executive decisions, in addition to reviewing the Operations Plan. The following agenda items are thus aligned with the priority actions.

2. GSICS CORRECTION FOR CURRENT INFRARED CHANNELS

2.1 Status of validation and acceptance of the GEO-to-LEO correction product (GCC)

The Panel recalled that 3 GEO-LEO inter-calibration products were in Demonstration Phase as defined by the GSICS Procedure for Product Acceptance (GPPA):

- GL 01.1.0 (EUMETSAT SEVIRI&IASI IR Correction) submitted by EUMETSAT on 10/05/2010
- GL 02.1.0 (MTSAT&IASI/AIRS IR Correction) submitted by JMA on 10/05/2010
- GL 03.1.0 (NOAA GOES&IASI/AIRS IR Correction) submitted by NOAA on 12/05/2010

2.2 Status of methodology review for LEO-to-LEO GSICS correction (GRWG)

The LEO-to-LEO methodology is still to be reviewed by GRWG. Meanwhile, a first LEO-LEO product is already in Demonstration Phase:

- LL 01.1.0 (PATMOS-x) submitted by NOAA on 16/07/2010

2.3 Report on ISRO infrared calibration activities

Mr Joshi presented the developments initiated at ISRO to perform intercalibration of INSAT-2A imager, Kalpana imager, and future INSAT-3D Imager and sounder, against AIRS and IASI simulated broadband channels.

The Panel welcomed this report and encouraged ISRO to pursue this development whilst taking advantage of the reference methodology and tools developed within the GSICS community. ISRO noted the steps to be taken in order to apply the GSICS Algorithm Technical Baseline Document (ATBD) to INSAT calibration.

Action EP 9.1: ISRO and the GCC to coordinate for the implementation of GEO-to-LEO algorithms by ISRO. (June 2011)

3. GSICS CORRECTIONS FOR HERITAGE INSTRUMENTS

NOAA has initiated work on the methodology for LEO-to-LEO heritage instruments. This should be proposed to the GRWG for review.

4. GSICS CORRECTION FOR VISIBLE CHANNELS

Scientific activities are actively pursued on Visible channel calibration, following an action plan established by GRWG, and will be discussed at the next Joint GRWG-GDWG meeting.

5. MICROWAVE ACTIVITIES

M. Goldberg reported on the work done by NOAA on the intercalibration of NOAA/POES MSU and AMSU radiances through Simultaneous Nadir Observations (SNO). The SNO intercalibrated radiances are consistent with radiances simulated from GPS Radio Occultation observations. When used in NCEP reanalysis, these radiances show a much more stable bias than without intercalibration.

ISRO questioned the relevance of GPS-RO observations in that context.

Y. Tahara remarked that the correction for MW radiances should take into account the Brightness Temperatures as well as scan angles and sensor geometry.

M. Goldberg recalled the on-going collaboration with GPM X-Cal. The Panel recalled the objective that GSICS and GPM X-Cal should work towards joint procedures.

Action EP-9.2: M. Goldberg will correspond with A. Hou (NASA) and propose a way forward for developing joint procedures among GSICS and GPM X-Cal when relevant. (June 2011)

6. CONSOLIDATION OF INFRASTRUCTURE AND GENERAL METHODOLOGY

6.1 Commissioning of export of the CNES SADE database (CNES)

CNES had provided, in advance of the meeting, a detailed progress report on the SADE database access for GSICS applications. The web structure for SADE export is now commissioned and will give on line access to 12 years of desert acquisitions over 20 sites. Files are organized by sensor, year and site, with each file containing 6 months of measurements over one site for all bands of one sensor. The following sensors are available : Polder 1 - 2, Parasol, VGT 1 - 2, MERIS, Aqua/MODIS, Spot HR, and will soon be complemented by Terra/MODIS and Landsat7/ETM+. Access to SADE data will soon be authorized to a few beta-testers: Marc Bouvet (ESA), Gyanesh Chander (USGS), Dave Doelling (NASA), Dave Smith (RAL), with other beta-testers to be added on request. After successful completion of the beta-testing, the access will be opened to "registered" GSICS and CEOS agencies.

6.2 IASI/AIRS traceability report (CNES)

The report from CNES indicated that progress had been made on broadband pseudo-channels inter-comparison, thanks to a better handling of missing AIRS pseudo-channels. A presentation will be made at the next GRWG (March 2011).

6.3 Guide for Estimation of Uncertainty in GSICS intercomparisons (NIST)

Progress was reported by NIST and EUMETSAT on this action. Rüdiger Kessel (NIST) provided advice to Tim Hewison (EUMETSAT) in developing a method of evaluating the uncertainty on the GEO-LEO hyperspectral IR inter-calibration products. A EUMETSAT Technical Note has been produced to support users in their application of these products and to provide an example of the methodology to other product generators.

Associated work highlighted that in order to achieve the goal of metrologically comparable results

between different sensors, it is necessary to eliminate the sensor-specific processing in the reference path instead of convoluting the reference data with the Spectral Response Function (SRF) of the calibrated sensor. It is thus proposed to establish Common Reference Channels with a common spectral convolution for all sensors and to consider generating additional products based on these. The difference in spectral response of a specific sensor channel and the Common Reference Channel would be characterized by the Spectral Mismatch δ_{Lr} . Its value would be dependent on the difference in the spectral response and the spectral variability of the target (Earth) for a given intensity or brightness temperature. This has been explained in articles in the GSICS Quarterly. (Namely Vol. 4 No.4 2010).

6.4 Unified web monitoring system for GSICS GEO-to-LEO Infrared Correction (JMA)

Y. Tahara presented the prototype web page under development by JMA for displaying the GSICS correction in a unified way. The Panel commended JMA for this work and felt that it was near to completion.

6.5 Status of the user registration concept (GDWG)

The GDWG had reported the complexity to implement an on line registration system for GSICS products, taking into account that the GSICS products of GSICS members are decentralized over several websites. The Panel agreed that the goal should not be to restrict or strictly control the access to GSICS products, but to systematically invite GSICS users to provide contact details in order to enhance the relationship between GSICS users and providers. It reformulated its former action EP-8.8 in this sense.

Action EP-9.3: GDWG to implement a systematic request for user contact information on the GSICS web sites. (June 2011)

7. ENHANCING INTERACTION WITH USERS

7.1 Outcome of second GSICS Users' Workshop

J. Lafeuille gave a brief synthesis of the outcome of the Second Users Workshop, which had been held on 21 September 2010 in Cordoba, Spain in the context of the EUMETSAT Meteorological Satellite Conference. There was a record attendance of 51 participants illustrating the broadening audience and membership of GSICS. The participants were informed on the status of GSICS products, methodologies, data management approach, infrastructure, and the documentation and other resources available through the website <http://gsics.wmo.int> and the [WIKI](#). Reports were provided by several Beta users. Feedback was provided by users involved in NWP (JMA and NOAA), climate product generation (CM-SAF and SCOPE-CM), research applications (CIMSS), and satellite operators (CMA, NOAA). While the overall feedback confirmed the relevance of the current work plan and priorities, some specific issues were raised and suggestions made.

The Panel tasked the GRWG and GDWG to review the issues and recommendations from the workshop and address them as appropriate.

Action EP-9.4: GRWG and GDWG to review the recommendations from the Second GSICS Users Workshop and address them as appropriate (March 2011).

7.2 Status of communication actions (conferences, publications, web, factsheets)

The Panel thanked NOAA (G. Ohring) and all other contributors for completing the paper that is now approved for publication in the BAMS. It noted that GSICS was involved or mentioned in a number of conferences, including the WMO-BIPM workshop on "Measurement Challenges for Global Observation Systems for Climate Change Monitoring" (WMO/TD-No. 1557).

The Panel noted that EUMETSAT had consulted GSICS Secretariat and Chair to update the EUMETSAT fact sheet on GSICS, and suggested to discuss with EUMETSAT the possibility of a

“GSICS fact sheet” derived from the EUMETSAT one.

Action EP-9.5: WMO to discuss with EUMETSAT the possibility of adapting the EUMETSAT/GSICS fact sheet to create a “GSICS fact sheet, taking due account of EUMETSAT copyright (June 2011).

A comment was made on the possible overlap between sensor related information provided by GSICS on the GCC web site, and equivalent information provided by the CEOS WGCV on its Cal/Val portal, with a risk of confusion if the two sources were not consistent.

Action EP-9.6: GCC to investigate the consistency of sensor SRF information among the GCC and the WGCV websites and inform WGCV with a view to establish web links if appropriate (June 2011).

8. EXPANDING MEMBERSHIP AND PARTNERSHIPS

8.1 JAXA

On behalf of JAXA, Mr Kazuo Umezawa informed the Panel that JAXA had decided to join GSICS as a full member. He emphasized that JAXA was planning to provide Earth Observation data for more than 13 years with the GCOM programme, and attached high importance to the calibration of these data; Jaxa is also willing to intercalibrate GOSAT against GSICS reference instruments such as METOP/IASI and AIRS..

The Panel expressed its high appreciation for the participation of JAXA in GSICS and welcomed Mr Umezawa and Mr Igarashi as new Panel members. The Panel looked forward to the presentation on JAXA calibration plans at the 10th Executive Panel session.

8.2 ISRO

The Panel recalled that ISRO had recently joined and invited ISRO to nominate representatives at the GRWG and the GDWG In order to fully benefit from, and contribute to, the collaborative scientific and technical work performed within these groups.

8.3 ROSHYDROMET

Dr Vasily Asmus indicated that, following the launch of Meteor-M1, Roshydromet was willing to participate more actively in GSICS and had nominated Dr Alexander Uspenskiy to participate in the Executive Panel. Representatives in the working group would be nominated shortly. The Panel welcomed the participation from Roshydromet.

(Note: After the meeting, Mr Alexey Rublev and Sergey Uspensky were nominated to GRWG and GDWG respectively).

8.4 USGS

The panel was informed on discussions held between the US Geological Survey (USGS) and WMO about the potential participation of USGS in GSICS, having regard to the important activity of USGS on space-based terrestrial observations through the LANDSAT programme. WMO was encouraged to pursue contacts with USGS with the expectation that USGS could soon join GSICS.

Meanwhile, it was agreed that USGS should be invited to participate in the next GRWG meeting and to express its views on the relevance of GSICS for terrestrial applications of LANDSAT data. This would be a new action, replacing Action EP-8.11.

(Note: on 14 December 2010, WMO received a letter from USGS indicating its decision to participate in GSICS and nominating Mr Gyanesh Chander to the Executive Panel.)

Action EP-9.7: GRWG Chair to invite USGS to report on relevance of GSICS for terrestrial applications of LANDSAT data at GRWG. (March 2011)

8.5 IMD

Dr Sharma indicated that IMD was interested in joining GSICS, considering that it had more than 25 years of experience with INSAT. IMD was interested, for example, in recalibrating the INSAT archived data for climate studies. The Panel welcomed the interest of IMD for GSICS and asked WMO to officially invite IMD to join GSICS.

Action EP-9.8: WMO to send a letter to the Director General of IMD inviting IMD to join GSICS.

8.6 Partnerships

Collaboration with CEOS WGCV is on-going. T. Hewison had reported that the WGCV IVOS sub-group had identified precise topics of common interest to WGCV and GSICS, including the solar channel calibration. The Panel welcomed such collaboration. Jo Schmetz suggested in particular that Marc Bouvet (ESA/ESTEC) and Jack Xiong (NASA/GSFC), who are experts in solar channel calibration and MODIS be invited to participate in the next GRWG meeting in order to support discussions on the development of inter-calibration products for channels in the solar-reflected band.

Action EP-9.9: GRWG Chair to invite Marc Bouvet (ESA/ESTEC) and Jack Xiong (NASA/GSFC) to present DMITRI (Database for Imaging Multi-spectral Instruments and Tools for Radiometric Intercomparison) and MODIS calibration at GRWG

Collaboration with SCOPE-CM is also on-going, with M. Goldberg participating in the SCOPE-CM Panel. The Panel recalled its expectation that SCOPE-CM should be in a position to issue a "Statement of needs" towards GSICS.

Action EP-9.10: M. Goldberg to invite SCOPE-CM to issue a Statement of Needs describing the deliverables expected from GSICS. (June 2011)

9. OVERALL WORK PLAN

The Panel noted the updated work plan prepared by the GCC and invited the GCC to continue to update the plan, taking into account the outcome of the present meeting.

J. Lafeuille presented the status of outstanding actions from the last meeting. The Panel agreed that the following actions were completed or replaced by new actions, and should thus be closed as indicated below:

Action EP-6.7: GCC to include on the GSICS web site an intellectual property statement including that use of GSICS data is subject to proper credit being given to GSICS.	End 2010	Completed. Disclaimer statements are displayed on the GCC website with conditions for use of the data.
Action EP7-5: GRWG/GDWG to submit GEO-LEO correction for acceptance in accordance with GPPA.	End 2010	Completed for GOES, Meteosat, and MTSAT: GEO-LEO corrections have entered the Demonstration Phase in July 2010
Action EP7-12: EUMETSAT to correct the CGMS and GSICS addresses on the fact sheet before further distribution.	20 September 2010	Completed. EUMETSAT redesigned the factsheet in consultation with WMO and the EP Chair.
Action EP-8.5: ISRO to present an overview on its calibration activities and plans at EP-9.	November 2010	Completed at EP-9 agenda, item 2

Action EP-8.6: ISRO to initiate Kalpana inter-calibration against IASI and AIRS, in coordination with GCC and report progress at EP-9.	November 2010	Completed at EP-9 agenda, item 2
Action EP-8.7: GCC to update the GPPA to include a high-level description of the algorithm, or reference to existing publication, upon submission of a product to allow checking the science background before accepting a demonstration.	End of May 2010	Completed.
Action EP-8.8: GDWG to define how to implement the compulsory registration of users on the GSICS web sites.	September 2010	Closed. Replaced by new action EP-9.3.
Action EP-8.9: The GSICS 2 nd User Workshop Programme Committee (T. Hewison, F. Wu, R. Iacovazzi, D. Renaut, R. Datla, J. Lafeuille) to prepare draft programme and invitations for mailing early June.	June 2010	Completed. Workshop was well prepared and successfully held on 21/09/2010 in Cordoba, Spain
Action EP-8.11: M. Goldberg to give a presentation at EP-9 on the relevance of GSICS for terrestrial applications of LANDSAT data.	November 2010	Closed. Replaced by new Action. EP-9.7.
Action EP-8.13: The WMO Space Programme (B. Ryan) to invite ROSHYDROMET to participate in GSICS in relation with Meteor-M and Electro-L missions.	End June 2010	Completed on 28/10/2010 ROSHYDROMET, at EP-9 confirmed its participation and will be represented at EP by Dr A. Uspensky
Action EP-8.14: ISRO, JAXA to consider nominating points of contacts for GRWG and GDWG in advance of the next sessions of these working groups.	End 2010	Completed for JAXA (See WP-03): <ul style="list-style-type: none"> • GSICS Executive Panel: Tamotsu IGARASHI and Kazuo UMEZAWA • GRWG: Keiji IMAOKA, Hiroshi MURAKAMI and Misako KACHI • GDWG: Kazuo UMEZAWA
Action EP-8.16: WMO (B. Ryan/J. Lafeuille) to communicate to KMA the appreciation of GSICS for the offer to host the next GRWG/GDWG meeting in Korea in March/ April 2011.	End May 2010	Completed on 7/07/2010. KMA confirmed readiness to host the joint meeting on 22-25 March in Daejeon
Action EP-8.18: J. Lafeuille to include status reports on GSICS overarching activities in the agenda of future Executive Panel sessions.	November 2010	Completed See EP-9 agenda
Action EP-8.19: Secretariat (J. Lafeuille) to ensure that the CEOS WGCV Chair is included in invitation list for future Executive Panel meetings.	September 2010	Completed G. Stensaas was invited.

The list of remaining outstanding actions and new actions from the meeting is provided in Annex 3.

10. ANY OTHER BUSINESS

No other business was discussed.

11. DATE AND PLACE OF NEXT GSICS MEETINGS

The next GRDG-GRWG meeting will be hosted by KMA. *(After the meeting it was confirmed that the meeting will be held in Daejeon, Republic of Korea, on 22-25 March.)*

The tenth Executive Panel meeting is proposed to be hosted by CMA. Subject to confirmation by CMA; it is tentatively scheduled for 6-8 June 2011 in China, the exact place being still to be determined.

12 CLOSURE OF THE SESSION

The Chairman expressed his great satisfaction that GSICS is expanding its membership and is making progress in all the areas that the Panel had identified as priority lines of activity.

After thanking the participants, and specifically IMD for hosting this meeting, he closed the session at 6 pm.

LIST OF PARTICIPANTS

NOAA	Mitch Goldberg (Executive Panel Chair)
EUMETSAT	Johannes Schmetz (Executive Panel member)
IMD	Ashok Kumar Sharma (invited expert)
ISRO	Pradip Kumar Pal (Representing A.S. Kiran Kumar) Pradeep K Thapliyal, Atul K Varma, Prakash Chandra Joshi
JAXA	Kazuo Umezawa (Executive Panel member) Tamotsu Igarashi (Alternate Executive Panel member)
JMA	Yoshihiko Tahara and Satoru Tsunomura (Representing Mr Tomoo Ohno)
KMA	Dohyeong Kim (Executive Panel member)
NASA	Brian Killough (Representing James Butler)
ROSHYDROMET	Vasily Asmus and Victor Saulskiy (Invited experts)
WMO	Jerome Lafeuille (Executive Panel Secretariat) Barbara Ryan (Director of WMO Space Programme)

M. Peng Zhang (CMA), Didier Renaut (CNES) and Raju Datla (NIST) were not in a position to attend or be represented at this meeting.

PROVISIONAL AGENDA

1. Opening of the session

- Introduction and welcome
- Adoption of the agenda

2. GSICS Correction for Current Infrared Channels

- Status of validation and acceptance of the GEO-to-LEO correction product (GCC)
- Status of methodology review for LEO-to-LEO GSICS correction (GRWG)
- Report on JAXA calibration plans (Action 8.4) (JAXA)
- Report by ISRO (Action 8.5 and 8.6) (ISRO)

3. GSICS corrections for heritage instruments

- Status of methodology review for LEO-to-LEO heritage instruments (GRWG)

4. GSICS Correction for Visible Channels

- Status of scientific activities on Visible channel (GRWG)

5. Microwave activities

- Status of collaboration with GPM X-Cal towards joint procedures (NOAA)

6. Consolidation of Infrastructure and General Methodology

- Commissioning of export of the CNES SADE database (CNES)
- IASI/AIRS traceability report (CNES)
- Guide for Estimation of Uncertainty in GSICS intercomparisons (NIST)
- Unified web monitoring system for GSICS GEO-to-LEO Infrared Correction (JMA)
- Status of ideas on user registration system (GDWG)

7. Enhancing Interaction with Users

- Status of feedback from beta users
- Outcome of second GSICS Users' Workshop (T. Hewison, F. Wu)
- Status of communication actions (conferences, publications, web, factsheets)

8. Expanding Membership and Partnerships

- Contacts with Roshydromet, ESA and USGS
- Collaboration with CEOS WGCV
- On-going collaboration with SCOPE-CM (M. Goldberg)

9. Overall work plan

- Updated work plan (GCC)
- Status of actions (J. Lafeuille)

10. Any other business

11. Date and place of next GSICS meetings

- Next GRDG-GRWG meeting
- Next Executive Panel meeting

REVIEW OF OUTSTANDING ACTIONS (as of 12 November 2010)

Action	Due date	Status as of November 2010
Action EP-3.6: GCC (F. Weng) will prepare a presentation on absolute calibration for MW channels at GRWG-5.	March 2011	Open (Due in 2011)
Action EP-6.1: GRWG to define what should be the key factors that need to be displayed in the GSICS Instrument Monitoring web sites.	End 2010 (NOAA paper in November 2010)	Open (Due end 2010)
Action EP-6.5: GRWG to consider the possible recommendations to GRUAN regarding coordinated radio-sondes and satellite observations (report to AOPC expected from NOAA/ Tony Reale) and report to Executive Panel members.	March 2011	Open (Due in 2011)
Action EP-6.15: R. Iacovazzi and J. Lafeuille to finalize the updated operations plan for publication on the GSICS web site.	September 2010	Open, planned by GCC and WMO
Action EP7-8: M. Goldberg to work with ISCCP to define the specifications of GSICS products, based on GSICS correction, to be used in ISCCP for comparative evaluation with the current ISCCP inter-calibration schemes, and to define practical modalities for such a test.	May 2010	Open
Action EP-8.1: WMO, GCC, all, to update GSICS web sites, presentation slides, fact sheets, to include reference to all Members, observers and partners.	June 2011 (New date)	Status to be checked. Renew the action if new members or partners join. Update should include the new GSICS logo.
Action EP-8.2: JMA, in consultation with GCC, to develop a prototype of a unified web page to display GSICS GEO-LEO IR results, along the lines of the sketch discussed among GRWG/GDWG.	End 2010	Open (due end 2010) On going. Excellent progress reported at EP-9
Action EP-8.3: JAXA to present an overview on its calibration activities and plans at an Executive Panel session.	June 2011	Planned for EP-10, June 2011
Action EP-8.4: JAXA and CNES to report at EP-10 on GOSAT-IASI inter-calibration.	June 2011	Open (due in 2011)
Action EP-8.10: WMO (J. Lafeuille) to circulate a draft revised documentation plan with more detailed contents of each document, as a prerequisite for developing these documents.	June 2011 (New date)	Open
Action EP-8.12: NIST (R. Datla) to develop a draft vocabulary, as part of a future guide on uncertainty for GSICS.	June 2011 (New date)	On going, progress reported at EP9

Action EP-8.14: ISRO, JAXA to consider nominating points of contacts for GRWG and GDWG in advance of the next sessions of these working groups.	End 2010	Open for ISRO (Completed for JAXA)
Action EP-8.15: The Chairman (M. Goldberg) and Secretariat (J. Lafeuille) to set-up a bi-monthly Executive Panel teleconference.	January 2011 (New date)	Open. Start in January 2011 Recommended time slot is 11:00 UTC

New actions from GSICS EP-9

Action EP-9.1: ISRO and the GCC to coordinate for the implementation of GEO-to-LEO algorithms by ISRO.	June 2011	
Action EP-9.2: M. Goldberg will correspond with A. Hou (NASA) and propose a way forward for developing joint procedures among GSICS and GPM X-Cal when relevant.	June 2011	
Action EP-9.3: GDWG to implement a systematic request for user contact information on the GSICS web sites.	June 2011 (New date)	
Action EP-9.4: GRWG and GDWG to review the recommendations from the Second GSICS Users Workshop and address them as appropriate	March 2011	
Action EP-9.5: WMO to discuss with EUMETSAT the possibility of adapting the EUMETSAT/GSICS fact sheet to create a "GSICS fact sheet, taking due account of EUMETSAT copyright.	June 2011	
Action EP-9.6: GCC to investigate the consistency of sensor SRF information among the GCC and the WGCV websites and inform WGCV with a view to establish web links if appropriate.	June 2011	
Action EP-9.7: GRWG Chair to invite USGS to report on relevance of GSICS for terrestrial applications of Landsat data at GRWG	March 2011	
Action EP 9.8: WMO to send a letter to the Director General of IMD inviting IMD to join GSICS.	February 2011	
Action EP-9.9: GRWG Chair to invite Marc Bouvet (ESA/ESTEC) and Jack Xiong (NASA/GSFC) to present DMITRI and MODIS calibration at GRWG	January 2011	
Action EP-9.10: M. Goldberg to invite SCOPE-CM to issue a Statement of Needs describing the deliverables expected from GSICS.	June 2011	