

**WORLD METEOROLOGICAL ORGANIZATION**



**GLOBAL SPACE-BASED INTER-CALIBRATION SYSTEM**

**EXECUTIVE PANEL**

**FIFTH MEETING**

**Maspalomas, Spain**

**7-8 November 2008**

**FINAL REPORT**



## 1. INTRODUCTION AND AGENDA

The fifth meeting of the GSICS Executive Panel (EXP-5) was held immediately after closure of the 36<sup>th</sup> meeting of the Coordination Group of Meteorological Satellites (CGMS-36) in Maspalomas, Gran Canaria, Spain.

The Chairman, Dr Mitch Goldberg, welcomed the Panel Members and the observers from ESA, JAXA, and Roscosmos. He recalled that several reports on GSICS achievements had been presented at CGMS-36 and he indicated that the main scope of this Executive Panel meeting was to finalize the discussion on items presented at the fourth meeting and to define the 2009 GSICS Operations Plan.

The final agenda is attached as Annex 1. The list of participants is attached as Annex 2.

## 2. SUMMARY MINUTES OF EXP-4

The final report of the fourth Executive Panel meeting (EXP-4) was adopted, including comments received from EUMETSAT and CNES. It will be posted on the WMO website: <http://www.wmo.int/pages/prog/sat/Reports.html#GSICS>

## 3. REVIEW OF OUTSTANDING ACTIONS FROM EXP-3 AND EXP-4

The status of outstanding actions from EXP-3 and EXP-4 was reviewed. The detailed status is included as Annex 3. Particular comments are reported below.

### **CLARREO**

As concerns Action EXP4-5, M.Goldberg commented that the NASA-NOAA [CLARREO](#) mission concept (Climate Absolute Radiance and Refractivity Observatory) had been recommended by the US National Research Council Decadal Survey and should provide essential benchmark measurements that would be of direct relevance for GSICS. It was agreed that a presentation on CLARREO would be made by NOAA at GRWG-4.

### ***Details on the proposed access to the SADE database content***

As concerns Action EXP4-8, CNES has reported in its written contribution that the integral SADE database cannot be open to GSICS members. Instead, a request mechanism was proposed to GSICS members, with the following scheme:

- A Web interface will be open to GSICS members to allow a request to the SADE database (name of satellite or instrument (s), period of interest, etc.);
- The requested data will be extracted by CNES from the database (expertise is required) ;
- Resulting data, graphs, tables... will be made available on the Web interface to the GSICS partner, with accurate format description.

If the GSICS Ex Panel concurs with this proposal, CNES could develop and implement it in the course of year 2009.

Adding new sites in the SADE database is indeed feasible. For example, the site of DOME-C (Antarctica) has been added without difficulties. But the main problem for additional targets is to find adequate sites (deserts for example), the most important features of calibration sites being their stability over time and their size. In the past, CNES has performed analysis of some sites over continents other than Africa, the result being quite disappointing, even if not necessarily exhaustive. CNES thus suggested that GSICS members propose potential calibration sites to CNES for analysis and test.

EXP-5 welcomed these proposals and invited CNES to present the proposed mechanism to the joint GRWG-GDWG meeting in February in order to review the precise modalities.

### ***Pre-launch instrument characterization***

As concerns Action EXP4-9 on pre-launch instrument characterization, a presentation has been made at CGMS-36 WG II, and CGMS gave an action to GSICS to finalize guidelines in collaboration with the CEOS WGCV.

### **WIGOS**

GSICS can be seen as an important contribution to the “Data quality assurance level” of the WMO Integrated Observing Systems initiative (WIGOS). This was pointed out by WMO at CGMS-36 in WMO-WP-23, and was among the feedback received from presenting GSICS in September 2008 at the 5<sup>th</sup> meeting of the Implementation Coordination Team on Integrated Observing Systems (ICT-IO5) of the Commission for Basic Systems Open Programme Area Group for Integrated Observing Systems (CBS/OPAG-IO5). A task to formulate a WIGOS Pilot Project based on GSICS was thus identified in the 2009 Operations Plan.

## **4. GSICS INFORMATION, SERVICES AND PRODUCTS ROSTER**

The Roster is intended to specify the services available from GSICS or under consideration for future development and implementation. It shall be used:

- by the Executive Panel to confirm the commitments of GSICS and to provide guidance to GCC and GPRCs for future developments
- by the GCC and GPRCs as a reference for their production and developments
- by GSICS users to identify relevant products to provide feedback on the specification of actual and planned products and services.

The Panel reviewed the Roster provided by R. Iacovazzi and felt that it was an important document. It requested to insert the following in the LEO-LEO and GEO-LEO calibration sections:

<ul style="list-style-type: none"><li>▪ <b>Graphs/Tables of results including a quarterly high-level performance assessment of the GEO-LEO intercalibration</b></li></ul>
<ul style="list-style-type: none"><li>▪ <b>GSICS best estimate calibration coefficients with error bars</b></li></ul>

Some corrections were also requested to Appendix 1A (about MT-SAT1R and -2) and Appendix 1B (about FY-3 payload). (Note: a comprehensive description of missions and instruments is available in Volumes I and II of CGMS-36 WMO-WP-16.)

The Panel considered that, with these amendments, the first version of the roster could be circulated for feedback to the following target customers or partners:

- GCOS Secretariat, with a view to have it circulated to the GCOS/WCRP AOPC and possibly other groups
- R/SSC-CM, to ask each R/SSC-CM project to indicate its particular requirements
- IASI workshop at ECMWF, May 2009
- CEOS WGCV.

The Panel agreed that the GRWG and GDWG should carefully review the roster, including its Appendix 2 that included many technical details, and make suggestions for a further update of this document. It is anticipated that the second version of the roster would specify the products more precisely.

## **5. PROCEDURE FOR PRODUCT ACCEPTANCE**

The Panel reviewed the Product Acceptance Procedure provided by R. Iacovazzi. As agreed at EXP-4, this revised version included the concept of “demonstration stage” of new products. It was underlined that the open availability of data was a key condition for interoperability.

The panel reviewed the procedure and amended it as follows:

- In Section 2, end of the 1st line, insert: “and to the availability of these products to the GSICS community”.
- In Section 2, 4th paragraph, after the 2nd sentence, add: “The benefit of this demonstration stage would also be to seek feedback from targeted users.”
- Annex A.1.3.1), Delete: “To be a GSICS product, the product must be able to be shared at least within the GSICS community.”

With these minor changes, the Panel adopted the procedure, and agreed to put it in operation as a first version, with the understanding that this procedure could be reviewed at a later stage in the light of experience.

## **6. REVIEW AND ADOPTION OF THE GSICS 2009 OPERATIONS PLAN**

The 2009 Operations Plan was discussed on the basis of:

- Draft provided by M. Goldberg
- Plans indicated at EXP-4 (Annex of the EXP-4 Minutes)
- Outcome of CGMS-36
- Written contribution of CNES.

The following structure was adopted:

- I. Project meeting milestones
- II. Outreach and user interaction
- III. Data management and other cross-cutting tasks
- IV. LEO-LEO UV, VIS, IR and MW intercomparison
- V. GEO-LEO algorithm development and comparison

The Panel agreed that GSICS had an important contribution to bring to meetings such as GEWEX Radiation Panel (GRP), the SPIE conference in San Diego, the GCOS Steering Committee, the WCRP Science Steering Committee. An action was given to all Panel members to identify by end of 2008 the major relevant meetings in order to organize GSICS participation in these meetings. J. Schmetz indicated readiness to present GSICS at the GRP in 2009.

CGMS had invited GSICS to perform an end-to-end demonstration and a task was included in this respect.

The GSICS 2009 Operations Plan resulting of this discussion is included as Annex 4. (Also available in MS Excel version)

## **7. COMMENTS ON THE MANUAL ON OPERATING PRACTICES FOR GRUAN**

Comments and suggestions regarding the future Manual on operating practices for the GCOS Reference Upper Air Network shall be forwarded to M. Goldberg by 30 November 2008.

## **8. REVIEW OF GSICS IMPLEMENTATION PLAN**

The GSICS Implementation Plan (IP) was initially drafted in 2005. Several points may need to be updated in the light of experience and achievements, for instance the Terms of Reference and description of roles, or the definition of GPRC. In this respect, it was clarified that R&D agencies would have an “operational” role within GSICS if they took responsibility for the routine

production of some intercalibration results, which could be for instance the case of CNES for Visible sensors.

.All Panel Members and WG chairs are invited to review the IP by 31 March 2009.

## **9. ANY OTHER BUSINESS**

### **a. GSICS article for the BAMS**

A paper on GSICS drafted by M. Goldberg, with the Panel Members as co-authors, for the Bulletin of the American Society, All Panel Members are invited to review the draft and send comments to M. Goldberg by 30 November.

### **b. CEOS WGCV Quality Assurance Framework For Earth Observation (QA4EO)**

The CEOS Working Group on Calibration and Validation has developed a Quality Assurance Framework for Earth Observation (QA4EO). This set of documents is available at:

<http://calvalportal.ceos.org/CalValPortal/showQA4EO.do?section=qa4eoIntro> .

The documentation has been available for review for a few months and will be presented for endorsement at CEOS Plenary on 11-12 November.

The Panel acknowledged the important work made by WGCV to develop the QA4EO.

The Panel supported the underpinning general principle that interoperability implied data quality and availability; indeed this principle is fundamental to GSICS, to CGMS and to the WMO Space Programme. They are also essential dimensions of the WMO Integrated Global Observing Systems (WIGOS) initiative.

The panel felt that the QA4EO provided an interesting conceptual framework to address data quality assurance, based on the experience of the CEOS WGCV. However, although the QA4EO was presented by its authors as a general framework for Earth Observation data, the Panel felt that its scope should be better qualified. For example, the proposed role of the WGCV as the agent in charge of approving the provision of data to GEO (See QA4EO-CEOS-GEN-DPK-001) might be adequate in a specific domain but certainly not universally applicable. It is recalled that space and surface observation data from the WMO Global Observation System (GOS) are made available every day in a worldwide interoperable fashion in accordance with rules and procedures that have been internationally agreed in the WMO framework.

In conclusion, the Panel considered that the QA4EO was a valuable work but should be reviewed in depth in order to assess its domain of applicability, bearing in mind that there may be different practices to achieve the goals of data quality assurance and different structures to implement them. The Panel tasked his Chairman to provide feedback to the WGCV Chair and expected that GSICS and WGCV would cooperate to progress in this area.

### **c. BIPM conference on measurement calibration and climate change**

J. Lafeuille briefly informed the Panel of a planned conference on measurement calibration and climate change, following an initiative of the Bureau International des Poids et Mesures (BIPM). (See: <http://www.bipm.org/en/home/> ). The Conference would be held in March 2010.

It was suggested to invite R. Datla (NIST) to represent GSICS in the Organizing Committee. It was furthermore anticipated that CGMS could be represented by B. Ryan (WMO).

#### **d. GSICS membership and representation**

Discussion with JAXA highlighted that there would be great mutual benefit to extend intercalibration activities to GOSAT, GCOM-W and GCOM-C. Mr Kazuo UMEZAWA , ([umezawa.kazuo@jaxa.jp](mailto:umezawa.kazuo@jaxa.jp) ) wished to be included in future mailing lists of the GSICS quarterly newsletter.

Mr Dohyeong KIM ( [dkim@kma.go.kr](mailto:dkim@kma.go.kr) ) indicated that he would now replace Mrs Milim OU as the KMA representative at the GSICS Executive Panel.

### **10. SUMMARY OF ACTIONS AND CONCLUSION**

The summary of actions from EXP-5 is included as Annex 5.

The next meeting is to be scheduled in the second quarter of 2009, tentatively in Geneva. The following meeting could be held in the context of CGMS-37, which will meet from 26 to 30 October 2009 in Korea.



**GLOBAL SPACE-BASED INTER-CALIBRATION SYSTEM (GSICS)  
EXECUTIVE PANEL, FIFTH MEETING**

7-8 November 2008, Maspalomas, Gran Canaria, Spain

**FINAL AGENDA**

- 1. INTRODUCTION AND AGENDA**
- 2. SUMMARY MINUTES OF EXP-4**
- 3. REVIEW OF OUTSTANDING ACTIONS FROM EXP-3 AND EXP-4**
- 4. REVIEW AND ENDORSEMENT OF THE GSICS INFORMATION, SERVICES AND PRODUCTS ROSTER**
- 5. REVIEW AND ENDORSEMENT OF THE PROCEDURE FOR PRODUCT ACCEPTANCE**
- 6. REVIEW AND ADOPTION OF THE GSICS 2009 OPERATIONS PLAN**
- 7. COMMENTS ON THE MANUAL ON OPERATING PRACTICES FOR GRUAN**
- 8. REVIEW OF GSICS IMPLEMENTATION PLAN**
- 9. ANY OTHER BUSINESS**
  - a. GSICS article for the BAMS**
  - b. CEOS WGCV Quality Assurance Framework For Earth Observation**
  - c. BIPM conference on measurement calibration and climate change**
  - d. GSICS membership and representation**
- 10. SUMMARY OF ACTIONS AND CONCLUSION**

**GLOBAL SPACE-BASED INTER-CALIBRATION SYSTEM (GSICS)  
EXECUTIVE PANEL, FIFTH MEETING**

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**LIST OF PARTICIPANTS**

NAME	First Name	ORGANIZATION	CAPACITY
ZHANG	Peng	CMA	
ORIOI-PIBERNAT	Evangelina	ESA	(Observer)
GAERTNER	Volker	EUMETSAT	(WGDG Chair)
SCHMETZ	Johannes	EUMETSAT	
UMEZAWA	Kazuo	JAXA	(Observer)
KURINO	Toshiyuki	JMA	
KIM	Dohyeong	KMA	
LEE	Hye-Sook	KMA	
GOLDBERG	Mitch	NOAA, NESDIS, STAR	(Chairman)
BABYSHKIN	Vladimir	Roscosmos/Lavochkin Association	(Observer)
TKACHENKO	Alexander	Roscosmos/Lavochkin Association	(Observer)
KOZEEV	Dmitriy	Roscosmos/TSNIIMASH	(Observer)
LAFEUILLE	Jerome	WMO	(Secretariat)
ZHANG	Wenjian	WMO	

CNES was not represented but had sent a written contribution in advance of the meeting.

**STATUS OF ACTIONS FROM EXP-3 AND EXP-4  
(as of 8 November 2008)**

<b>N°</b>	<b>Actions from EXP-3</b>	<b>Status</b>
EXP3-2	The GCC will make software tools available for IASI-AIRS co-location. (Need to put SW tools in repository for GSICS members)	<b>CLOSED</b>
EXP3-4	CNES will advise GSICS on the instrument to be taken as a reference for Visible channels.	<b>IN PROGRESS.</b> No advice at the moment, but MODIS data have been inserted in the SADE database (years 2005 and 2007 complete, year 2008 ongoing) and the analysis is currently performed. MERIS data are already inserted in SADE and validated. Next year, CNES plans to perform the MODIS-MERIS intercalibration and present the results at a GRWG meeting. MERIS data accessibility to all GSICS members still needs to be investigated.
EXP3-5	GDWG and GRWG will hold short monthly "tag-up" meetings to keep track of the actions and maintain a close coordination among GSICS partners.	GRWG started telephone conferences. GDWH initiated virtual meeting with Centra. <b>CLOSED.</b>
EXP3-6	GCC (F. Weng) will prepare a presentation on absolute calibration for MW channels at GRWG-3.	<b>OPEN.</b> Relevant for GPM, should not consider "absolute" calibration only.

<b>N°</b>	<b>Actions from EXP-4</b>	<b>Status</b>
	<i>Deriving from an EXP-3 Action):</i> V. Gaertner to propose a tool for on-line meetings	Done. V. Gaertner has initiated on-line GDWG meetings with "Centra". <b>CLOSED</b>
EXP4-1	R. Datla to circulate to EXP + WG Chairs (via WMO) the draft CEOS WGCV document on data quality assurance	Done. Will be discussed at EXP-5. <b>CLOSED.</b>
EXP4-2	J. Lafeuille to include Tim Hewison in GRWG (secondary poc)	Done. <b>CLOSED</b>
EXP4-3	J. Lafeuille to ask GPRCs to nominate a poc for operational matters	<b>OPEN.</b> Pending finalization of Product Acceptance Procedure
EXP4-4	WMO (with Ex Panel Chair) to prepare formal report to CGMS on GSICS annual achievements and results	Done by Chair and WMO. <b>CLOSED</b>
EXP4-5	M. Goldberg to present at CGMS-36 a WP on CLARREO project	<b>CLOSED.</b> <b>NEW ACTION:</b> <b>NOAA to report on CLARREO project at GRWG-4</b>
EXP4-6	J. Lafeuille to report on GSICS at ET-SAT/SUP and: - Seek feedback on GSICS Information, Services & Product Roster - Seek wider participation in GSICS (ISRO, Roshydromet, ESA)	Report provided at ICT-IOS-5 instead. GSICS was seen as an important project and fully relevant to WIGOS. <b>CLOSED</b>

EXP4-7	All GSICS members invited to review the JMA GSICS website and provide comments to JMA (Yoshihiko Tahara) via Google	Many comments were received and the website has been updated accordingly. <b>CLOSED</b>
EXP4-8	CNES to further investigate opening SADE access to GSICS partners and feasibility of including additional targets from other regions to support calibration of different GEO satell	(See details below). CNES has proposed a mechanism for requesting data from SADE and is prepared to add new sites to SADE if these sites are of suitable quality. <b>CLOSED.</b> <b>NEW ACTION:</b> <b>CNES is invited to report at GRWGG – GDWG in January 2009 on the mechanism for requesting data from the SADE database.</b>
EXP4-9	R. Datla and WGCV Chair to present at CGMS-36, via NOAA, a Working Paper on pre-launch characterization of sensors	Done at CGMS-36 (NOAA-WP-32) <b>CLOSED.</b> <b>NEW ACTION (from CGMS-36):</b> <b>GSICS, in consultation with the CEOS WGCV, to finalize the development of guidelines for pre-launch instrument characterization.</b>
EXP4-10	GCC to implement operational JMA code for MTSAT-AIRS/IASI, and adapt it to each GEO, in order to serve as GSICS baseline algorithm for comparison/benchmarking purpose plan .	<b>In progress.</b> Part of the GSICS 2009 Operations Plan.
EXP4-11	All GPRCs to perform operational GEO-LEO intercalibration using possibly an optimized algorithm with respect to the baseline algorithm	<b>In progress.</b> Part of the GSICS 2009 Operations Plan.
EXP4-12	Executive Panel Members to review the GSICS Implementation Plan and consider the relevance of drafting an update or an additional strategy document (for Exp-5)	<b>OPEN</b> Will be discussed by EXP-5 under item 8
EXP4-13	GDWG and GRWG Chairs to initiate preparation of a GSICS User Workshop in 2009 (e.g. in conjunction with EUM User Conference)	<b>OPEN</b> Included in the 2009 Operations Plan.
EXP4-14	GCC to set up bi-monthly teleconference with the GPRCs poc and the 2 WG Chairs (tentatively: 11h00 UTC) no later than Sept.08	<b>OPEN</b> Operational pocs need to be defined, meetings could start in 2009.
EXP4-15	GSICS Ex Panel Members to provide comments on the Manual on Operating Practices for GRUAN sites by October 2008 (e.g. recommendation on launch schedules of radiosondes) with the aim to forward consolidated comments to GCOS JPO by end of 2008	<b>OPEN</b> Will be discussed by EXP-5 under item 7
EXP4-16	J. Lafeuille to ask GPRCs to nominate poc for product acceptance and inform R. Iacovazzi	<b>OPEN.</b> Pending adoption of the procedure
EXP4-17	Detailed implementation of the hierarchical ATBD structure to be finalized by GRWG	<b>OPEN</b> Action for GRWG
EXP4-18	GCC (R. Iacovazzi) to amend the draft Procedure for Product Acceptance (PPA) introducing the concept of product <i>demonstration status</i> in advance of product <i>endorsement</i> by the Executive Panel.	Done, will be discussed by EXP-5 under item 5. <b>CLOSED</b>
EXP4-19	All Executive Panel Members, GRWG and GDWG to review the draft GSICS Information, Services and Product Roster by end of October 08	On agenda of EXP-5 <b>CLOSED</b>

EXP4-20	GCC to update the GSICS Product and Services Roster to include: - A priority qualification - Quarterly high-level performance assessment of the GEO-LEO intercalibration (priority) - “Best calibration coefficients”	Will be discussed by EXP-5 under item 4. <b>CLOSED</b>
EXP4-21	J. Lafeuille to make EXP-4 presentations available on-line at: <a href="http://www.wmo.int/pages/prog/sat/meetings/GSICS-ExecutivePanel-4.html">http://www.wmo.int/pages/prog/sat/meetings/GSICS-ExecutivePanel-4.html</a>	Done <b>CLOSED</b>
EXP4-22	Next GSICS Exec. Panel meeting to be held around CGMS-36 in Gran Canaria on 7-8 Nov 2008 . The agenda shall include: - Review of the GSICS Information, Services & Product Roster - Review comments on Manual on Operating Practices for GRUAN - Adoption of 2009 Operating Plan - Review of GSICS Implementation Plan	Meeting held, with these items on the agenda. <b>CLOSED</b>
EXP4-23	Toshi Kurino will investigate the possibility for JMA to host GRWG4-GDWG3. <b>CLOSED</b>	Meeting confirmed for 28-30 January 2009 <b>CLOSED</b>
EXP4-24	GRWG4-GDWG3 meeting to be convened on 28-30 January in Tokyo. <b>PLANNED</b>	Invitation is being sent out by JMA. <b>CLOSED</b>

## GSICS 2009 OPERATIONS PLAN

Task Name	Lead	Description	Deliverable	Q1	Q2	Q3	Q4
<b>Project meeting milestones</b>		<b>Governance</b>					
Executive Panel Meeting	EP	Provide the GSICS program guidelines	Meeting report		Δ		Δ
GRWG/GDWG Joint Meeting	GDWG/GRWG	Resolving related data and science issues	Meeting report	Δ			
GRWG Web Meeting	GRWG	Support GSICS by resolving related scientific issues	Meeting report	Δ	Δ	Δ	Δ
GDWG Web Meeting	GDWG	Support GSICS by resolving related data management issues	Meeting report		Δ		Δ
<b>Outreach and user interaction</b>		<b>Inform GSICS community &amp; beyond and seek feedback</b>					
Quarterly Newsletter	GCC	Inform members and stake-holders	Newsletter delivered electronically	Δ	Δ	Δ	Δ
Quarterly Anomaly Reports	All GPRCs	Reports of satellite instrument anomalies	Quarterly Report	Δ	Δ	Δ	Δ
GSICS Information, Services, and Products Roster (GISPR)	EP, GCC	<ol style="list-style-type: none"> <li>Submit to NWP and climate user groups</li> <li>Review the feedback received</li> </ol>	Submit to GCOS, RSSC-CM, CEOS WGCV, NWP workshop	Δ			
GSICS Users' Workshop	GDWG-GRWG	Support GSICS by interacting and getting input from User community	Meeting report			Δ	
End-to-end demonstration	GCC, GDWG, GRWG, ExP	establish an end-to-end demonstration toward an operational GSICS by including beta-users in the GSICS process	Report from the beta users				Δ
Report to GCOS/AOPC	EP	Inform GCOS/AOPC and coordinate with their activities	Briefing and debriefing		Δ		
Report to CEOS Cal/Val	EP	Inform CalVal and coordinate with their activities	Briefing and debriefing			Δ	
Report to CEOS plenary	WMO	Inform CEOS and coordinate (as part of WMO report)	Briefing and debriefing				Δ
Report to CGMS	WMO, EP	Inform CGMS and coordinate with their activities	Briefing and debriefing				Δ
Participate in Conferences/workshops/panels		Participate in GRC, SPIE, WCRP/SSC, GCOS/SC, BIPM to raise awareness and get feedback					
BAMS article on GSICS	EP	Inform satellite and user community about GSICS	Draft paper			Δ	
WIGOS Pilot Project	GCC, WMO	To develop WIGOS Pilot Project proposal based on GSICS activities (CGMS 36 Action...)		Δ			

<b>Data Management and other cross-cutting tasks</b>		<b>Specify, organize, archive and disseminate GSICS data and information</b>				
GSICS Web Sites	GCC, All GPRCs	Provide information, reports, results and links to Members	GSICS web site	Δ	Δ	Δ Δ
File and Parameter Naming Conventions	GDWG	Adopt and amend an established file and parameter naming conventions appropriate for GSICS data sets.	GSICS File and Parameter Naming Systems	Δ		
GSICS Collaborative Server	EUMETSAT, NOAA	Collaborative Servers up and running with THREDDS/OPeNDAP software and common directory structure	On-line functional collaborative data servers		Δ	
GEO-LEO IR imager channel updates to collaborative server and web	All GPRCs	Post GEO-LEO IR imager channel updates to collaborative server and web	Available data sets, plots, and tables of results	Δ	Δ	Δ Δ
GSICS Twiki	All	Begin to create collaborative GSICS documentation using TWiki software running on NOAA server	LEO-LEO and GEO-LEO documentation 80 % complete	Δ	Δ	Δ Δ
Documentation	GDWG	Initial archiving of documentation and codes	Description and initial archiving			Δ
Result template	GRWG-GDWG	Improve and harmonize presentation of results in graphs and tables	Templates		Δ	
Service Specification	GCC + GPRCs	Detail the specification of products and make it available through a portal	Detailed product descriptions			Δ
Product Acceptance Procedure implementation	GCC+ GRWG +GDWG	Establish scientific and data management criteria to be met by GSICS products	Criteria			Δ
SADE data request mechanism	GRWG-GDRG-CNES	Adopt a mechanism for SADE data requests from GSICS partners, implement by CNES	Interface implemented	Δ		
Additions to SADE targets	GRWG-CNES	Propose / evaluate new targets sites for inclusion into SADE, to be discussed at CNES at joint GRWG-GDWG+C24	Selected targets	Δ		

Instrument monitoring website	GCC+ GDWG	Recommendations for instrument performance monitoring website (CGMS 36 Act...WGII)				
Instrument characteristics repository	GCC + GPRCs	To make available the instrument characterization of their imaging and sounding instruments in polar and geostationary orbit, in particular the spectral response functions, through a link from the GCC website (CGMS 36 Act...WGII)	Links to detailed characteristics			Δ
Pre-launch actions	NIST + GCC, EXP	Pre-launch instrument characterization guidelines(See action 5.3) Action to be conducted in cooperation with CEOS WGCV	Guidelines			
Instrument calibration	GRWG	Develop a procedure to calculate the best estimate of a calibration of a particular instrument channel at a given point in time	Procedure			

LEO-LEO UV, Visible, IR and MW Intercomparison		Evaluate LEO Satellite Instrument Calibration					
LEO-LEO operational updates	NOAA/CMA	Add new LEO satellite instruments (NOAA-N', FY-3), create and implement NetCDF output modules, and expand documentation	New data for evaluation, output and filename structures aligned with GSICS standards, completed documentation				Δ
LEO-LEO microwave imager inter-comparison	NOAA	Perform baseline inter-sensor calibration for microwave imagers (SSM/I, SSM/IS, TMI, WindSat, AMSR-E, etc.)	Evaluation report			Δ	
LEO-LEO GOME-2 and OMI data inter-comparison	NOAA	Establish and implement software for LEO-LEO GOME2 and OMI data inter-comparison	Evaluation report			Δ	
LEO-LEO Analysis	NOAA	Routinely evaluate measurement comparability (AMSU, SSM/I, HIRS, AVHRR, MODIS, AIRS)	Evaluation report	Δ	Δ	Δ	Δ
Regular AIRS-IASI comparison	CNES / NOAA	Routinely evaluate measurement comparability (IASI, AIRS) through several methods	Report	Δ		Δ	
LEO-LEO historical analysis	NOAA	Perform SNO analysis for historical operational AVHRR, AMSU-A, MSU, HIRS, etc.	Pending External Funding	Δ	Δ	Δ	Δ
LEO-LEO product acceptance within GSICS	GCC, GRWG, GDWG, EP	Put LEO-LEO product through GSICS Procedure for Product Acceptance	GSICS EP Approval of LEO-LEO Product				Δ
<b>Further developments (LEO-LEO)</b>							
LEO-LEO Visible channel calibration on special targets	CNES	Using SADE database, intercalibration of MODIS, MERIS, SPOT/VGT, Parasol, plus extension to AVHRR data from the long term data range processing	Results				

<b>GEO-LEO Algorithm development/ Implementation</b>		<b>Evaluate GEO and LEO Satellite Instrument Calibration</b>					
GEO-LEO Inter-Calibration for IR channels	All geo-GPRCs	Routine inter-calibration of respective GEO with AIRS and IASI	Periodic delivery of results to GCC			Δ	
GEO-LEO Inter-Calibration for IR channels	GCC	Establish baseline inter-calibration of all GEOs with AIRS and IASI	Baseline comparison as needed			Δ	
Algorithm Comparison	GCC	Compare algorithms and their results at GPRCs, focusing on IR for 2009	Report of differences and suggestions of improvements				Δ
<b>Further developments</b>							
AIRS/IASI Inter-Calibration using geostationaries as Transfer Radiometer	NOAA, EUMETSAT, KMA, JMA	Evaluate the AIRS/IASI difference with "double differencing" of (GOES-AIRS) - (GOES-IASI)	Evaluation report		Δ		
GEO Midnight Calibration Anomaly	JMA/NOAA	Use GSICS LEO-GEO inter-calibration to assess the status (MTSAT) and correction (GOES) of the midnight calibration anomaly	Evaluation report			Δ	
GOES-13 Imager 13.3 um Channel SRF correction	NOAA	Use GSICS LEO-GEO inter-calibration to quantify and correct errors in GOES-13 Imager 13.3 um channel SRF	Implementation to NOAA Satellite operation	Δ			
RTM Bias Characterization	NOAA	RTM bias characterization for select GEO and LEO IR and microwave instrument window channels, and possibly IR water vapor channels for selected clear atmospheric conditions	Evaluation results			Δ	
GEO and LEO Solar Channel Inter-Calibration	All geo-GPRCs	Demonstrate a baseline algorithm	Initial results and evaluation				Δ

## ACTIONS RESULTING FROM EXP-5

N°	Outstanding actions from EXP-3 and EXP-4 (as updated by EXP-5)	Deadline
EXP-3.4	CNES will advise GSICS on the instrument to be taken as a reference for Visible channels.	28 January 09
EXP-3.6	GCC (F. Weng) will prepare a presentation on absolute calibration for MW channels at GRWG-4.	28 January 09
EXP-4.3	J. Lafeuille to ask GPRCs to nominate a poc for operational matters	December 2008
EXP-4.10	GCC to implement operational JMA code for MTSAT-AIRS/IASI, and adapt it to each GEO, in order to serve as GSICS baseline algorithm for comparison/benchmarking purpose plan.	August 2009
EXP-4.11	All GPRCs to perform operational GEO-LEO intercalibration using possibly an optimized algorithm with respect to the baseline algorithm	August 2009
EXP-4.12	Ex.Panel, GCC, GRWG, GDWG to review the GSICS Implementation Plan and consider the relevance of drafting an update or an additional strategy document	31 March 09
EXP-4.13	GDWG and GRWG Chairs to initiate preparation of a GSICS User Workshop in 2009 (e.g. in conjunction with EUM User Conference)	September 2009
EXP-4.14	GCC to set up bi-monthly teleconference with the GPRCs poc and the 2 WG Chairs (tentatively: 11h00 UTC) (Operational pocs need to be defined)	January 2009
EXP-4.15	GSICS Ex Panel Members to provide comments on the Manual on Operating Practices for GRUAN sites by October 2008 (e.g. recommendation on launch schedules of radiosondes) with the aim to forward consolidated comments to GCOS JPO by end of 2008	30 November 08
EXP-4.16	J. Lafeuille to ask GPRCs to nominate poc for product acceptance and inform R. Iacovazzi	December 2008
EXP-4.17	Detailed implementation of the hierarchical ATBD structure to be finalized by GRWG	28 January 09

N°	New actions from EXP-5	Deadline
EXP-5.1	NOAA to report on CLARREO project at GRWG-4	28 January 09
EXP-5.2	CNES to report at GRWGG – GDWG in January 2009 on the mechanism for requesting data from SADE database.	28 January 09
EXP-5.3	NIST (R. Datla) and the GCC, in consultation with the CEOS WGCV, to finalize the development of guidelines	October 2009

	for pre-launch instrument characterization.	
EXP-5.4	J. Lafeuille, M. Goldberg and GCC, to present a proposal for GSICS as a WIGOS Pilot Project	January 2009
EXP-5.5	J. Lafeuille to circulate GSICS Roster to GCOS Secretariat and to R/SSC-CM for comments	December 2008
EXP-5.6	M. Goldberg to present GSICS Roster to CEOS WGCV and to IASI Workshop for comments	December 2008 / May 2009
EXP-5.7	GDWG-GRWG to refine product and service specification in the GSICS Roster	October 2009
EXP-5.8	All Panel members to identify the major relevant meetings where GSICS should be represented in 2009, and indicate their availability to represent GSICS when appropriate.	31 December 08
EXP-5.9	Panel Members to review the draft BAMS paper and send comments to M. Goldberg	30 November 08
EXP-5.10	All Panel Members to review the CEOS WGCV Quality Assurance Framework for Earth Observation and send comments to M. Goldberg	31 December 08
EXP-5.11	J. Lafeuille to update GSICS Executive Panel Membership	30 November 08
EXP-5.12	EXP-6 to be convened in Geneva (TBC) in the second quarter of 2009.	28 February 09