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

Hampton Inn, Cocoa Beach, Sunday 4 November 2007

FINAL REPORT

1. Introduction

M. Goldberg introduced the new Panel Members: Jim Butler, representing NASA, and Raju Datla, representing the National Institute of Standards and Technology (NIST). He indicated that W. Rossow had been invited to attend the meeting for ISCCP. ISCCP had a longstanding experience of satellite inter-comparison, mainly for broadband imaging channels, and a dialogue between GSICS and ISCCP should be beneficial.

M. Goldberg recalled the objectives of the meeting to review the 2008 workplan and discuss additional issues namely pre-launch characterization and ISCCP experience. The agenda (Rev.2) was agreed and is attached as Annex 1. The list of participants is attached as Annex 2.

2. Status of implementation of GSICS

2.a Highlights of the GSICS Operations Plan

M. Goldberg recalled the overall objectives of GSICS, the main milestones of the 2007 work plan and proposed to put more emphasis on pre-launch characterization of instruments.

2.b GCC

R. Iacovazzi presented the GCC team structure and reported on GCC activities including the implementation of the website, the quarterly newsletter, the development and delivery of algorithms and software to the GPRC. He described the software architecture for LEO-LEO and GEO-LEO SNO, reported on AIRS-IASI comparison via pseudo-channels, and the development of a IASI-GOES comparison algorithm.

He reported on LEO-LEO intercalibration routinely performed by NOAA and on NOAA/HIRS performance monitoring in the form of time series.

The Panel noted that results are provided on the GSICS website within the “Science” pages..

2.c EUMETSAT

J. Schmetz reported on operational Meteosat-HIRS comparisons, with results available on the EUMETSAT web for Meteosat First Generation. He indicated that the common GSICS GEO-LEO algorithm had been implemented and should be operationally available by end of year 2007.

He recalled some important recommendations of the GRWG that should be brought to the attention of the forthcoming CGMS-35 meeting, namely to systematically perform instrument performance monitoring; to monitor AIRS and IASI in particular depth and document the results; to establish a repository of such information on the GSICS website.

Based on J. Schmetz' presentation, the following was agreed:

- NESDIS will inform EUMETSAT of each monthly update of AVHRR solar bands coefficients in order to allow EUMETSAT to update the coefficients in its processing at the same time.
- The GCC will make software tools available for IASI-AIRS co-location.

J. Schmetz also suggested a role for GSICS at the development stage of new satellite programmes. While the Panel agreed that it was highly desirable, it was not clear how to ensure a proper involvement of GSICS.

2.d CMA

J. Xu reported on FY-2 C/D calibration at the National Satellite Meteorology Centre of CMA (NSMC). Calibration of the IR channels is performed over ocean cloud-free areas by comparison with radiances simulated by MODTRAN radiative transfer model applied to surface data from ocean buoys and atmospheric profiles provided by NCEP global model

CMA also regularly performs comparison with MODIS, using radiative transfer model to account for differences in spectral response.

2.e JMA

T. Kurino reported on JMA activities and presented the content of MSC monitoring web pages, which included MTSAT automatic monitoring results for navigation and radiometric calibration. He indicated that GMS data were being reprocessed, using AVHRR data as an anchor to ensure consistency among data of consecutive GMS satellite missions, and comparing level 2 products (Aerosol Optical Thickness and Cloud Optical Thickness) with corresponding MODIS products when available.

He indicated that JMA was developing a Visible inter-calibration method using separate sets of clear sea, deserts and cloudy targets. JMA also develops a refined spectral compensation method for the comparison of broadband and hyperspectral instruments.

He presented the GSICS/GPRC team at JMA who works in cooperation with Universities and other research institutes.

- The Panel clarified that the monitoring by NWP centres was very useful to identify short-term changes and inconsistencies, but was not a relevant reference for instrument calibration.

2.f CNES

D. Renaut reported on CNES activities using the SADE (Calibration Data Repository) database. The database is being extended; it is used for operational monitoring of SPOT/High Resolution Visible, SPOT/Vegetation, Parasol, Formosat-2, Kompsat-2 and MERIS calibration.
He reported on early IASI calibration and validation results that show excellent and stable performances with respect to specifications; preliminary inter-calibration with AIRS shows very good agreement; detailed IASI calibration results are available on the CNES web site and a IASI workshop is planned on 13-16 November in Toulouse.

- The Executive Panel commended CNES for the excellent work performed, which allowed IASI to quickly become a reference instrument. The good connection that had been established between industry, space agency and user community was underlined as a key factor of success.

As concerns future activities, CNES agreed to continue in-depth IASI performance monitoring and to perform AIRS-IASI inter-comparison on a periodical basis, which will provide independent results to be compared with the IASI-AIRS intercomparison performed by GCC and by NASA. CNES highlighted the need to improve access to MODIS and AIRS data for these activities.

- NOAA (GCC) will support CNES if necessary for AIRS and MODIS data access.
- The Panel strongly recommended considering regular comparisonsof IASI and AIRSwith aircraft measurements. The aircraft instrument needs to be traceable to SI standards for absolute calibration.

With reference to the work plan adopted by the second Executive Panel, CNES clarified that Visible intercomparison tasks would be performed in cooperation with EUMETSAT, with CNES focusing on LEO-LEO aspects. The Panel noted that EUMETSAT would deal with GEO-LEO aspects, and would use the SADE targets monitored by CNES.

- CNES will advise GSICS on the instrument to be taken as a reference for Visible channels.

2.g KMA

KMA reported that tests were performed using MTSAT data to generate simulated COMS data. It planned to implement in 2008 the GEO-LEO software to perform inter-comparison of AIRS infrared channels with MTSAT, on one hand, and with simulated COMS data, on the other hand.

2.h NIST: pre-launch characterization of instruments

R. Datla introduced pre-launch characterization approach adopted by NIST, with the example of SeaWiFS, and indicated the readiness of NIST to assist on this matter. He stressed the need to anticipate and plan calibration activities early enough to provide feed-back, from the calibration viewpoint, on sensor design and mission requirements.

- The Panel agreed that GSICS should adopt Guidelines describing the best practices for pre-launch characterization.
- The Guidelines on pre-launch characterization should capture relevant experience from previous instruments and would allow developing the role of GSICS as a kind of "Advisory Board" able to assist agencies developing new programmes.
- The Guidelines are expected to help as a source of additional specifications in the instrument procurement phase

The Panel noted an action started by the CEOS WGCV in this respect, and looked forward to considering the outcome of this WGCV action.

3. Outcome of GRWG and GDWG

3.1 Outcome of GRWG-1 and GRWG-2

F. Wu presented the outcome of the second GRWG meeting, held in conjunction with GDWG-1.

The first actions had been completed, namely the provision of v1 of a GEO-LEO algorithm and subset of AIRS data. Other tasks were on-going or to be started.

Introducing early results of GOES-AIRS inter-comparison, he pointed out the need to include nadir and off-nadir observations in order to sample different Local Solar Time situations.

3.2 Outcome of GDWG-1

V. Gärtner summarized the outcome of the first GDWG meeting, held in conjunction with GRWG. He proposed to expand the group with new EUMETSAT participants and other agencies. He reported that suitable data formats were being selected, taking into account current practices in the user community.

He mentioned that the GDWG had identified several issues that would be addressed in the coming months: practical definition of collocated datasets, archiving strategy, configuration control, metadata model, file naming convention.

- The Panel endorsed the conclusions of GDWG
- The Panel confirmed that one of the GSICS deliverables should be the designation of one state-of-the art algorithm; GSICS should provide the global user community with the reference algorithm and the resulting calibration information of relevant instruments. The reference algorithm would not be changed unless it was demonstrated that a new algorithm provides significantly more accurate results.

- Along with established practice within the research community, proposals for alternative algorithms or variants should be based on a demonstration of significant improvements with respect to the current reference.

- The Panel endorsed the suggestion that the GDWG and GRWG hold short monthly "tag-up" meetings to keep track of the actions and maintain a close coordination among GSICS partners.

4. Update on ISCCP calibration activities

W. Rossow, as outgoing Chair of the Gewex Radiation Panel, highlighted a number of issues that had been identified throughout the ISCCP instrument calibration activities.

He recalled for instance that, at high latitudes, sun-synchronous satellites were not viewing the same illumination conditions in Summer and Winter, this difference being particularly important for early morning (dawn-dusk) orbits.

He recommended using all data rather than a sampling, to monitor many different statistics, to monitor variations at all scales and to analyze the results in great detail.

5. Future GSICS Work Plan

The Panel summarized the planned actions for 2008 for visible and infrared channel calibration and inter-comparison and agreed that the approach for microwave channels should be refined.

- GCC (F. Weng) to prepare a presentation on absolute calibration for MW channels at GRWG-3

Based on the Executive Panel discussions, the 2008-2009 GSICS Operations Plan is summarized in the table in Annex 3.

6. Relations with other relevant projects

The Panel confirmed the wish to keep close links with GEWEX/GRC/ISCCP.

J. Lafeuille informed the Panel on the concept of Regional/Specialized Satellite Centres, and the Panel agreed that it would propose, in due time, a representative at the R/SSC-CM Executive Panel in order to ensure full consistency and smooth working relationship among the two projects.

The Panel felt useful to maintain a close relationship with CEOS WGCV, through the participation of the GSICS EXP Chairman in the WGCV.

The Panel was informed of contacts between GCC and the NASA-JAXA GPM project team and looked forward to the report of GRWG-3 and the presentation on MW absolute calibration.

J. Lafeuille reported on the outcome of the GCOS Atmospheric Observation Panel for Climate (AOPC) and in particular on the request from AOPC to cooperate with GSICS for the GCOS Reference Upper-Air Network (GRUAN). It was agreed that GSICS should participate in the forthcoming GRUAN workshop.

- M. Goldberg will participate in the GRUAN workshop to be held in Germany on 26-28 February 2008

7. Summary of actions

Action EXP3-1. NESDIS will inform EUMETSAT of each monthly update of AVHRR solar bands coefficients in order to allow EUMETSAT to update the coefficients in its processing at the same time.

Action EXP3-2. The GCC will make software tools available for IASI-AIRS co-location.

Action EXP3-3. NOAA (GCC) will support CNES if necessary for AIRS and MODIS data access.

Action EXP3-4. CNES will advise GSICS on the instrument to be taken as a reference for Visible channels.

Action 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.

Action EXP3-6. GCC (F. Weng) will prepare a presentation on absolute calibration for MW channels at GRWG-3

Action EXP3-7. M. Goldberg will participate in the GRUAN workshop to be held in Germany on 26-28 February 2008

Action EXP3-8. NOAA to convene GRWG-3 and GDWG-2 in Camp Springs on 19-21 February 2008.

ANNEX 1

GLOBAL SPACE-BASED INTER-CALIBRATION SYSTEM (GSICS)
EXECUTIVE PANEL, THIRD MEETING
AGENDA (Rev.2)

1. Introduction (9h00)
   Welcome, introduction to the objectives of the meeting
   Agenda
2. Status of implementation of GSICS activities
   a. Highlights of the 2007 GSICS Operation Plan (9h05)
   b. Report from the GSICS Coordination Centre (GCC) (9h20)
   c. Report from EUMETSAT (9h40)
   d. Report from CMA (10h00)
   e. Report from JMA (10h20)

   Break (10h40-11h00)

   f. Report from CNES (11h00)
   g. Report from KMA (11h20)
   h. Report from NIST on pre-launch characterization of instruments (11h40)
3. Outcome of joint meeting of GRWG-2 and GDWG-1 (12h00)
   a. Outcome of GRWG-2/GDWG-1 and status of related actions
   b. Discussion

   Lunch Break (13h00-14h00)
4. Update on ISCCP and related calibration activities (14h00)
5. Future work plan (14h30)
   a. Priorities, expected deliverables
   b. Activities of GCC and other partners
   c. Guidance to GRWG and GDWG
   d. Next meetings and other milestones

   Break (16h00-16h20)
6. Relations with other relevant organizations and projects (16h20)
   a. ISCCP
   b. R/SSC-CM network (Ref. to outcome of ET-SAT/SUP-3)
   c. CEOS WGCV
   d. GPM project
   e. GRUAN (Ref. to outcome of GCOS/AOPC)
   f. Potential new GSICS partners : NASA, ROSHYDROMET
7. AOB (17h00)
8. Summary of actions and conclusion (17h10-17h30)

ANNEX 2

LIST OF PARTICIPANTS

Executive Panel Members

Mitch Goldberg (NOAA, GSICS Ex. Panel Chairman)

JianMin Xu (representing Naimeng Lu, CMA)

Didier Renaut (CNES)

Johannes Schmetz (EUMETSAT)

Toshiyuki Kurino (JMA)

Mi-Lim Ou (KMA)

Jérôme Lafeuille (WMO)

Other invited participants

Jim Butler (NASA)

Raju Datla (NIST)

Volker Gärtner (EUMETSAT, GDWG Chairman)

Donald E. Hinsman (WMO, D/SAT and AD/WWW)

Rober Iacovazzi (NOAA, GCC)

Dongfeng Luo (CMA)

William B. Rossow (CCNY, Head of ISCCP/ Global Processing Center)

Kum-Lan Kim (KMA)

ANNEX 3

GSICS SUMMARY OPERATIONS PLAN FOR 2008

DOMAIN	TASK	TARGET DATE	ACTIONEE
INFRARED			
	Operational LEO-LEO intercomparison (excluding IASI)	Available, to be continued	NOAA, NASA
	Operational IASI-AIRS SNO	June 08, then continued	NOAA, NASA
	Periodical IASI-AIRS SNO	Available, to be continued	CNES
	IASI performance monitoring and in-depth analysis (Use of aircraft data when available)	Continued after Cal/Val	CNES
	Operational GEO-LEO intercomparison using the GCC provided software	March 08 (?) then continued	CMA, NOAA, EUMETSAT, JMA, KMA
	Use of aircraft data when available for AIRS and IASI performance monitoring		Not identified
VISIBLE			
	Regular LEO visible channels calibration and intercomparison using SADE. Periodical reports to GSICS	Developments and trial in 2008 Operational in 2009	CNES
	Regular Meteosat visible channels calibration and intercomparison with LEO using SADE	?	EUMETSAT
	Algorithm applicable to all GEO visible channels	?	?
	Regular GEO visible channel calibration and intercomparison with reference	?	CMA, JMA, NOAA
MICROWAVE			
	TBD		
CROSS-CUTTING			
	Guidelines on pre-launch characterization to be considered with the outcome of CEOS WGCV	?	NIST
	Maintain repository of algorithm and calibration data	Continuous	GCC
MEETINGS		**DATE**	**PLACE**
	Joint GRWG3-GDWG2	19-21/02/08	Camp Springs
	4th Executive Panel (EXP-4)	11 July 08 (TBC)	Geneva