GSICS MW products and a path forward.?

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MW Subgroup Meeting

January 6, 2016

Outline

- Introduction
- Results of the User Feedback
- MW In-Orbit references
- What are potential GSICS Products?
- Summary

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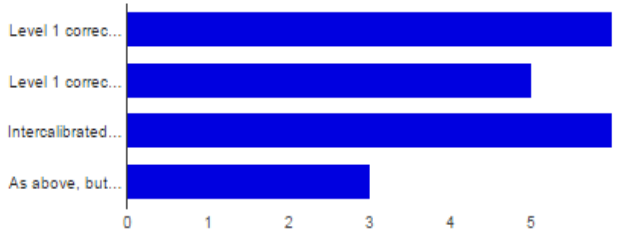
Results of User Feedback survey

What is of most interest to you and your institution for MW calibrated products?

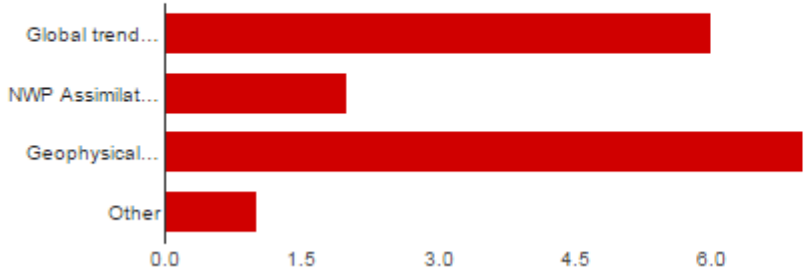


Level 1 corrected radiances for operational sensors (e.g., AMSU, MHS, ATMS, etc.)	6	75%
Level 1 corrected radiances for research sensors (e.g., GMI, AMSR-2, SAPHIR, etc.)	5	62.5%
Intercalibrated radiances (L1) from long term time series (e.g., all AMSU-A, AMSU-B)	6	75%
As above, but also including other 'similar' sensors (e.g., MSU to AMSU-A, AMSU-B to MHS to ATMS, etc.)	3	37.5%

What is the latency and frequency of updates to the corrections needed?

A more frequent and less precise set of corrections	1	12.5%
A less frequent and more precise set of corrections	7	87.5%

How would you utilize such information in your work?



Global trend Monitoring	6	75%
NWP Assimilation and Reanalysis	2	25%
Geophysical Retrievals	7	87.5%
Other	1	12.5%

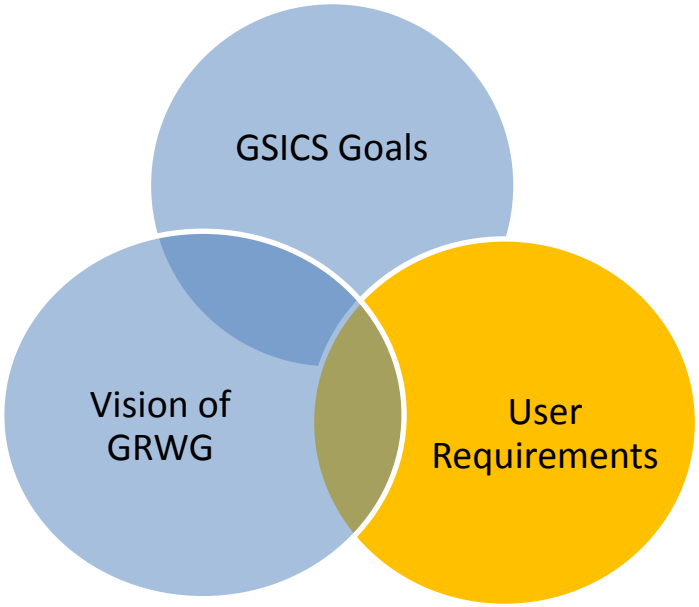
To begin with → Need a platform for providing corrected radiances

Platform could consist of in-orbit references & algorithm to meet
& backed by tools such as ICVS to enable root cause analysis.

Introduction

Do we currently have MW cross calibration products ? NO

- The MW subgroup was re-formed in 2013.
- The GPM-X Cal and the CEOS-WGCV are closely linked with GSICS MW subgroup activities.
- Currently the subgroup has no products but discussions to identify products and deliverables are underway.



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Commitment from agency

A verification/validation report.
-impact assessment ->
How does the product help the agency

A Review Board report.

Factors that help in identification of MW products

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In-orbit references

Do we currently have in-orbit references for MW ? NO

The AMSU/MSU L1B FCDR for O_2 bands resembles a typical in-orbit reference that is stable and accurate.

- Has scan angle corrected radiances
- Trends have been removed
- Undergone stringent quality assurance test
- Real time quality flags for each pixel come with the product

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AMSU/MSU FCDR as a reference: Current progress

- **Coded and Setup an AMSU – ATMS inter-comparison SNO algorithm**
- **NOAA-GDWG has helped AMSU FCDR resemble a typical MW orbit file – scan time stamps that can be used to generate SNO's, uniformity of file format (NetCDF4) across time spans has been achieved.**
- **Computed AMSU footprint size**
- **Created a three month database of AMSU-FCDR – ATMS collocations.**
  - Scan angle corrected BT included that resemble RVS corrected IASI/VIIRS radiances and are used as reference.

Next steps- analyze the collocations data set

Once we have an in-orbit reference we can generate in-orbit cross calibration products

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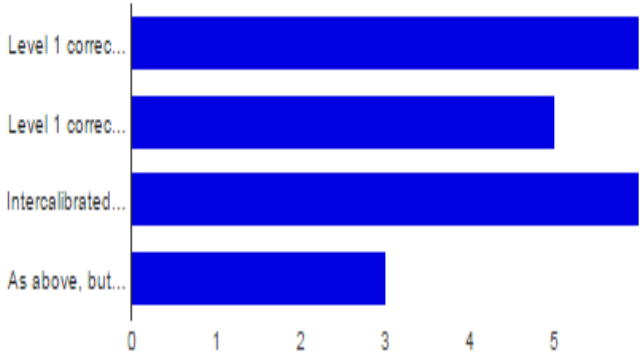
Potential GSICS MW Products

- **MW products come in two classes:**
  - **Retrospective type products (FCDR "components" – geolocation, scan biases, intersatellite corrections, etc.)**
  - **Forward looking (quasi-real time) products**
- **A possible path forward:**
  - **Determine from users what specific MW products they would like to see from GSICS (A question posed in last User's Meeting)**

User Response from survey

What is of most interest to you and your institution for MW calibrated products?



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Can we consider corrected radiances (and corrections) for AMSU, ATMS, GMI, MHS as GSICS products?

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More possible MW deliverables and products

- **Level 1 adjustments and corrections** **(Result in Classical products)**
  - **Methods (e.g., SNO or double difference)**
  - **Need to address**
    - References, transfers, stability
    - Spectral region idiosyncrasies
- **Satellite and Instrument Data Bases**
  - **OSCAR (SRF -> product, etc.)**
  - **Provide Geolocation and FOVs**
  - **Identify and catalog anomalies and periods of coverage**
- **FCDRs and ECVs**
  - **Users for reanalysis versus real time**
  - **Components, homogenization approach (Documented, reviewed algorithms)**
  - **MW FCDR to GSICS Product example for discussion**
- **References** **(These cover all spectral regions not just MW.)**
  - **Solar**
  - **Lunar (ROLO and GIRO)**
  - **DCC (radiance levels, frequencies?)**
  - **Targets (Surfaces emissions and reflectivities?)**
- **Tools (SNO identifier, Display Graphics, Communication, Notification …)**
- **Documents (Journal articles, ATBDs, Users' manuals)**
- **RTMs (Vicarious calibration, Error analysis, O-B bias, and comparisons studies)**
- **Stability versus Traceability**

Larry, EP -16+

Range of deliverables can be identified

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Interaction with GPM-X Cal and CEOS WGCV

In terms of developing GSICS Products for Microwave instruments, the considerations should be:

1. What are the user's requirements for inter-calibration products?
2. What can we do to meet the desired performance?
3. Can we make products that fit within existing GSICS Conventions and systems?

GPM X-Cal Meeting

GSICS was again represented at a recent meeting of the GPM X-cal Working Group by Tim Hewison, who provided an update on the GSICS Procedure for Product Acceptance and access to products through the GSICS Data and Products Servers. This group has made excellent progress in establishing inter-calibration methods for the TRMM Microwave Imager, TMI, and WindSat and plan to extend these methodologies to include other conically scanning microwave imagers, as well as the window channels of cross-track sounders. They are also investigating other methods, such as NWP double-differencing, for the sounding channels. More details of the meeting can be found at http://www.gpm-x-cal.info/. Future interaction between GPM X-cal and GSICS were discussed, identifying a need for addition support to adapt this group's valuable work into GSICS-compliant products. It is intended that this will be performed as part of a GSICS subgroup of microwave experts.

Cheng-Zhi Zou leading the interaction with WGCV

MWSG Chair to have a communication with GSICS on how WGCV can offer support on best practices.

WGCV Secretariat to send out the list of potential GSICS-WGCV Cooperation items outlined by GSICS to each subgroup chair

WGCV (Completed) Subgroup Chairs to identify and prioritize specific activity areas for interaction with GSICS.

MW subgroup has close links with GPM-X Cal and CEOS-WGCV and will focus on building these relationships in 2016

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Summary

- Efforts are underway to identify in-orbit references to open the gates for inter- comparisons and inter- comparison product generation.
- Provide algorithms and data bases to the MW community (GCC working on a GPPA stamp to deliverables).
- Identify best practices for Pre and Post flight characterization .
- Ties with GPM-X and WGCV can be further strengthened.
- A package for root cause analysis/analytics on the ICVS can be delivered.
- For those who may be coming to the GRWG/GDWG, we can focus on these and other topics during planned ½ day meeting of MW Sub-Group

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THANK YOU

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