GSICS MW SubGroup

12 January 2018 – 1200-1330 UTC

GSICS Microwave Sub-Group web meeting
Friday, 12. January 2018
13:00 | Europe Time (Berlin, GMT+01:00) | 1 hr 30 mins
Meeting number (access code): 955 107 552
Host key: 477733
Meeting password: gsics

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Agenda for Today

1. Welcome, new members and general business (Ralph) (5 min)
2. Last meeting action items/update (some are found in agenda topic 3) (All – 15 min)
   - Update the Microwave Wiki Workspace further (ALL)
   - Redefine and issue GSICS MW user requirements (Manik, Ralph, Karsten, Cheng-Zhi, Masaya)
   - Contact Dave Kunkee regarding MW sensor definitions (Ed Kim)
   - Try to get a NOAA commitment to support SNO/GRUAN and GPSRO colocation "targeting" for MW sensors (Ralph and Tony)
3. Status of **OPEN** 2017 GDWG+GRWG Action Items (30 min)
   - GMW2017.6b.1 – ATMS on JPSS-1 (E. Kim/M. Liu)
   - GMW2017.6c.1 and 6d.1 - Feasibility of FCDR's as products (K. Fennig/C-Z. Zou)
   - GMW2017.6e.1 – NIST Calibration Reference (D. Houtz)
   - GMW2017.6f.1 - MW Sensor Inventory (J. Park)
   - GMW2017.6f.2 - GRUAN (T. Reale)
   - GMW2017.6g.1 – MW RTM comparison (I. Moradi)
4. Status of new Action from GSICS EP – EP-18.02 – GRWG to assess the utilization of RO for MW instrument monitoring purposes (10 min) (R. Ferraro)
5. Planning for MW Session at 2018 GRWG+GDWG Annual Meeting – (R. Ferraro) (10 min)
6. Science/Agency Reports (10 min each)
   - CMA Update – S. Hu (TBC)
   - ICDR's from ATMS (C-Z. Zou)
7. AOB, wrap up, next meetings, etc. (5 min)

GRWG and EP Action Items

Action Id	Item	Effort Level	Urgency	Summary	Lead	What to Do	Expected Completion	Actual Completion	Deliverable Usage	Status
A.GMW.2017.6b.1	ATMS on JPSS-1			Priovide an update on the status after launch (launched in Nov. 2017)	Ed Kim	Information	2017-12-01	2018-01-12		Open
A.GMW.2017.6c.1	Microwave imager CDR			Determine feasibility of extracting the inter-calibration algorithms and coefficients from the FCDR and making them a GSICS product.	Karsten Fennig	Analysis	2018-03-01			Open
A.GMW.2017.6d.1	Microwave sounder CDR			Determine feasibility of extracting the inter-calibration algorithms and coefficients from the FCDR and making them a GSICS product.	Cheng-Zhi Zou	Analysis	2018-03-01			Open
A.GMW.2017.6f.1	MW Sensor inventory			MW Subgroup chair to develop candidate satellite/sensor (inventory), perhaps in the form of a graphical aid, as in orbit references for specific channels (based on some predetermined set of parameters that Manik has outlined...) and note pros and cons, other attributes (publications, etc.)? It should include timelines of sensors and overlap periods.	Ralph Ferraro	Information	2018-03-01			Open
A.GMW.2017.6f.2	GRUAN Study			Tony Reale (NOAA) to provide a draft uncertainty analysis describing the comparison of example (microwave) instruments to GRUAN sondes.	Tony Reale	Analysis	2018-03-01			Open
A.GMW.2017.6g.1	MW RTM comparison			MW co-chair to develop set of specific tasks to be performed by the Subgroup to intercompare RTM output over static references and surface models. Tasks to be identified within 6 months (Sep. 2017).	Isaac Moradi	Information	2017-09-30			Open
A.GMW.2017.5g.1	MW Naming Convention/Metadata			MW subgroup would contact NOAA GDWG to get support for product creation if needed.	Ralph Ferraro	Tech Support	2018-03-01			Open
R.GMW.2017.6a.1	MW Lunar Calibration			Get an update from Martin in approx. 6 months.	Martin Burgdorf	Information	2017-09-30	2017-10-12		CLOSED
R.GMW.2017.6e.1	NIST calibration reference			Get an update from Derek in approx. 6 months.	Derek Houtz	Information	2017-09-30			Open
EP-18.02	Utilization of RO			GRWG to assess the utilization of RO for MW instrument monitoring purposes	MW	Analysis				Open

Planning for MW Session at 2018 GDWG+GRWG

- Challenges we are facing:
  - How many MW scientists will be in Shanghai?
    - Manik, Ralph?, Xailei, Lin, CMA?
  - How many are willing to participate remotely
    - Martin, Rachel, Tiger, Cheng-Zhi, Johnny, Karsten, Jun, Misako, Takashi
  - Time zone considerations
    - Shanghai is +13 hours from US (East); + 7 hours from Europe – Is pm session (Shanghai) best option?
  - How reliable will remote participation be?
- Topics we could focus on (depends on who participates):
  - Response to active action items/new actions assigned
  - Lunar calibration
  - GPSRO
  - FCDR
  - Etc.

	UTC-5 hrs	UTC+1	UTC + 7 hrs
UTC	**US East (local)**	**Germany (local)**	**Asia (local)**
0	-500	100	700
100	-400	200	800
200	-300	300	900
300	-200	400	1000
400	-100	500	1100
500	0	600	1200
600	100	700	1300
700	200	800	1400
800	300	900	1500
900	400	1000	1600
1000	500	1100	1700
1100	600	1200	1800
1200	700	1300	1900

Members

Representation from ~12 space institutions and their related affiliates

Signed up as of September 2017

- NOAA (and affiliates) - Ralph Ferraro (Chair), Huan Meng, Cheng-Zhi Zou, Tony Reale, Mark Liu, Manik Bali (Univ. Maryland), Isaac Moradi (Univ. Maryland), Hu ("Tiger) Yang (Univ. Maryland), Wenze Yang (Univ. Maryland), Johnny Luo (City College New York), Xailei Zou (Univ. Maryland), Lin Lin (Univ. Maryland), John Yang (Univ. Maryland)
- EUMETSAT (and affiliates) – Tim Hewison, Karsten Fennig, Viju John, Jörg Ackermann, Sabatino DiMichele, Sante Laviola, Vinia Mattoli, Sreerekha Thonipparambil, Christophe Accadia, Martin Burgdorf, Imke Hans, Ralf Bennartz
- NASA (and affiliates) – Ed Kim (GSFC), Tanvir Islam (JPL), Linwood Jones (Univ. of Central Florida), Rachael Kroodsma (Univ. of Maryland), Wes Berg (Colorado State Univ.), Thomas Holmes
- NIST – Derek Houtz, David Walker, Dazhen Gu
- ECMWF – Steve English, Heather Lawrence
- CMA (and affiliates) – Songyan Gu, Qifeng Lu, Lin Chen, Hu Yang, Xiaolong Dong, Shengli Wu, Xiuqing Hu
- KMA (and affiliates) – Jun Park, Dong-Bin Shin (Yonsei University, South Korea), Dohyeong Kim, Minju Gu
- JAXA (and affiliates) - Misako Kachi, Takashi Maeda
- IISC – Ram Ratan

Backup Slides

Scope of Microwave Sub-Group

- Understanding the users' requirements for inter-calibration products for microwave instruments
  - Imagers + sounders – passive only (initially, but eventually consider active if there is a need…)
  - Retrospective calibration (CDR's and their components like geolocation, scan biases, inter-satellite)
  - Forward looking calibration (near-real time uses)
- Identifying existing products that could meet those requirements, but first….
  - Need to define criteria…Reference standards (sensor(s), models, calibration methodologies….)
  - And then a process that adheres to GSICS principles
- We should also focus on tools/algorithms like SNO, Double Difference, RTM, etc.
  - Might be something more feasible in near term?
- Define data standards (jointly with GDWG)
- Encourage the creators of those products to submit them to the GSICS Procedure for Product Acceptance (GPPA), once its defined for MW
  - Candidates include Cheng-Zhi Zou (MSU-AMSU), Karsten Fennig (SSMI), GPM X-Cal LUT's
- Coordination with other groups (e.g., CEOS WGCV MW, GPM X-Cal) would also be required to generate standards and best practices

Focus Topics for 2017-2018

- Defining CLEAR PATH for **GSICS MW products and algorithms**
  - Methodologies *(Jun Park, Rachel Kroodsma)*
    - SNO, Double difference, etc.
  - Reference Standards *(Manik Bali, Isaac Moradi, ~~David Walker~~)*
    - A particular sensor? Likely to be wavelength dependent (e.g., window, O_2, H_20); A RTM?
  - LUT/Correction Tables *(Karsten Fennig, Cheng-Zhi Zou, Viju John)*
    - Near real-time and climate; they will be different
- Tying together other groups/opportunities
  - Engaging more closely GPM X-Cal *(Wes, Rachel)*
    - *Participation our 2016 GUW; Participation at this meeting!*
  - Formalizing linkages to CEOS MW subgroup *(Cheng-Zhi, Xiaolong Dong)*
    - *CEOS-GSICS Microwave Coordination Meeting – 2016 July 5-6, Beijing, China*
  - Expanding active participation *(Manik, Ralph)*
- Continued participation by subgroup at meetings of relevance:
  - GSICS; CEOS;CALCON, Microrad 2017, AMS Sat. Met, EUMESAT Satellite, etc.

In response to Action Items (1/3)

A.GMW.2017.6c.1 and 6d.1

- An ad-hoc team was formed and first met on 25 July 2017, with several email threads since….
  - Ferraro, Bali, Fennig, Zou, Takahashi (GDWG)
- Issues we are struggling with:
  - No MW standard – where do we start?
  - Different channel classes that can be treated differently
  - Sounders and imagers – incidence angles, polarization, …
  - What EXACTLY do users want and need?
  - Climate type corrections cannot necessarily be unraveled into near real time type of corrections
    - ICDR's are now being generated…will 1-2 month lag suffice? Things don't change that quickly, esp. for "mature" sensors

In response to Action Items (2/3)

A.GMW.2017.6c.1 and 6d.1

- Let's recall some basic GSICS principles
  - Instrument monitoring
  - Standardized tools/methodologies/best methods for all agencies to adopt
- Path forward
  - Get clarification on user needs (Ralph, Manik)
    - Redo user survey
    - Determine core set of operational users from agencies, include diversity (e.g., Data assimilation, weather, climate, …)
  - Define short term (~1 year) and long term (~3 year) goals
  - Standardize tools (Karsten, Cheng-Zhi, Tony, …)
    - SNO, use of GRUAN, use of GPSRO, etc.
    - Use CDR (ICDR?) as references?

In response to Action Item (1/2)

A.GMW.2017.6f1

- Goal – develop a useful matrix of sensor information that ultimately, could be in a query type format for easy use for comparison
- Useful information supplied by:
  - Wes Berg (X-CAL), Thomas Holmes (internal) use, WMO/OSCAR
- Ralph developed a draft matrix; Jun has filled some this in
  - Need feedback

In response to Action Item (2/2)

A.GMW.2017.6f1

					Channel Specifications						Scanning Geometery					
Satellite	Sensor	Launch Date	rt of Operat	of Operat	Central Frequency (GHz)	Bandwidth (MHz)	Polarizations	NEDT	IFOV	Pixel	Technique	Swath	Scan Rate	Orbit	Antenna	Comments
GCOM-W1	AMSR-2	5/18/2012	8/10/2012	Ongoing	6.925 7.3 10.65 18.7 23.8 36.5 89	350 350 100 200 400 1000 3000	V, H V, H V, H V, H V, H V, H V, H	0.3 K 0.3 K 0.6 K 0.6 K 0.6 K 0.6 K 1.1 K	35x62 km 35x62 km 24x42 km 14x22 km 11x19 km 7x12 km 3x5 km	10x10 km 10x10 km 10x10 km 10x10 km 10x10 km 10x10 km 5x5 km	Conical; 55 deg	1450 km	40/min	1330 LTAN	2 m	
ADEOS-2	AMSR	12/14/2002	2002	2003	6.925 10.65 18.7 23.8 36.5 50.2 53.8 89.0	350 100 200 400 1000 200 400 3000	V, H V, H V, H V, H V, H V, H V, H V, H	0.3 K 0.7 K 0.7 K 0.6 K 0.7 K 1.8 K 1.6 K 1.2 K	40x70 km 26x46 km 15x26 km 12x20 km 7.6x13 km 5.5x9.6 km 5.2x9.0 km 3.1x5.4 km	50x50 km 50x50 km 25x25 km 25x25 km 15x15 km 10x10 km 10x10 km 5x5 km	Conical; 55 deg	1600 km	40/min	1030 LTAN	2 m	
Aqua	AMSR-E	5/4/2002	2002	2017	6.925 10.65 18.7 23.8 36.5 89.0	350 100 200 400 1000 3000	V, H V, H V, H V, H V, H V, H	0.3 K 0.6 K 0.6 K 0.6 K 0.6 K 1.1 K	43x75 km 29x51 km 16x27 km 14x21 km 9x14 km 4x6 km	10x10 km 10x10 km 10x10 km 10x10 km 10x10 km 5x5 km	Conical; 55 deg	1450 km	40/min	1330 LTAN	1.6 m	
GPM core	GMI	2/27/2014	2014	2017	10.65 18.7 23.8 36.5 89.0 166.0 183.31±7 183.31±3	100 200 400 1000 6000 4000 2000 2000	V, H V, H V V, H V, H V, H V V	0.96 K 0.84 K 1.05 K 0.65 K 0.57 K 1.5 K 1.5 K 1.5 K	19x32 km 11x18 km 9.2x15 km 8.6x14 km 4.4x7.2 km 4.4x7.2 km 4.4x7.2 km 4.4x7.2 km	12x13.4 km 6x13.4 km 6x13.4 km 6x13.4 km 3x13.4 km 3x13.4 km 3x13.4 km 3x13.4 km	Conical; 53 deg	850 km	32/min	65 deg inclinatio n	1.2 m	
egha-Tropiqu	MADRAS	10/12/2011	2011	2017	18.7 23.8 36.5 89.0 157.0	200 400 1000 1700 1700	V, H V V, H V, H V, H	0.43 K 0.44 K 0.36 K 0.42 K 1.13 K	40x60 km 31x47 km 20x31 km 10x15 km 6x9 km	40x16 km 40x16 km 40x16 km 10x16 km 6x16 km	Conical; 56 deg	1700 km	24.6/min	20 deg inclinatio n	0.65 m	
	SAPHIR		2013-01-15		183.31±0.2 183.31±1.1 183.31±2.7 183.31±4.2 183.31±6.6 183.31±11	200 350 500 700 1200 2000	H H H H H H	2.0 K 1.5 K 1.5 K 1.3 K 1.3 K 1.0 K	10 km		X-Track; 130 steps of 10 km ssp		Along-track; one 10-km lines every 1.6 s			

Radiometer | Sheet2 | Sheet3