**GSICS Microwave Subgroup Meeting Minutes**

**1200-1400 (UTC)** **21 January 2021**

**Attendees:** Misako Kachi, Quanhua “Mark” Liu, Qifeng Lu, Fabien Carminati, Jian Shang, Shengli Wu, Cheng-Zhi Zou, Paul Poli, Rachael Kroodsma, Timo Hanschmann, Vinia Mattioli, Viju John, Manik Bali, and Ed Kim

**Information given in presentations is not reflected in the notes.**

**1)** **Plan for MW Group activities (Co-Chairs Qifeng Lu (CMA) and Mark Liu (NOAA))**

*Comments*:

* Qifeng - CMA expressed a desire to share Precipitation Radar (PR) and WindRad data and information to perform bias corrections, calibration methods, and standard data format exchange. The latter can be performed with the help of GSICS Data Working Group.
* Qifeng - There will be no Microwave Subgroup sub-conference within the GSICS Annual Meeting this year.

*Questions*:

Misako - Will we have active microwave researchers in our group?

* Qifeng – Yes. Jian Shang is working on PR within CMA, and is reaching out for collaboration.
* Misako – JAXA has PR and synthetic aperture radar experts. They are not available in March, but maybe at some other time.

Misako - Will SAR be included in the Microwave Subgroup?

* Qifeng - Yes.

ACTION: Cheng-Zhi will provide an FCDR presentation for the next meeting. Robbie will make sure Cheng-Zhi is getting the Subgroup mail distributions.

**2)** **GCOS Reference Upper-Air Network (GRUAN) and its Applications - F. Carminati (UK MetOffice)**

*Questions*:

Robbie - Is there a central repository for GRUAN data?

* Fabien - Yes there is. It can be accessed through the website.

Ed - Are the results suggesting we need better instrument calibration or traceability of calibration?

* Fabien - We need to improve understanding of the uncertainty of NWP products used for comparison. It is difficult detect with statistical confidence small homogeneous bias of the order of the instrument radiometric accuracy for water vapor channels when using NWP background as reference comparator, but it is fine for biases varying in space (e.g., surface type or scan geometry). For satellite comparisons against GRUAN, need to account for uncertainties related to collocation and the RT model.

Ed - One slide seems to refer to value related to absolute satellite instrument calibration. Are these values assumed to be achieved, or not yet achieve and need to be achieved?

* Fabien - The instrument has not been launched yet. Use an uncertainty model to detect biases. For 1K accuracy need a better uncertainty in NWP model. We don’t adequately represent NWP model uncertainty. The small uncertainty of satellite measurements is better than NWP as a reference.

Vinia – Have you ever considered to perform the analysis exercise for MWS also for ICI ?

* Fabien – We could use the GRUAN processor to estimate our capability to assess ICI with NWP model fields.

**3) Bias assessment of SSMT2 microwave FCDR at EUMETSAT/C3S – Paul Poli (EUMETSAT)**

*Comment:*

Qifeng – NWP reanalysis can be good for finding bias in old instruments.

*Questions:*

Ed Kim – What is the impact of satellite local equatorial crossing time (LECT) drift. Does FIDUCEO consider this? Also, how was F10 handled since it was not placed in the correct orbit?

* Paul Poli – The analysis uses the geolocation information in the FIDUCEO data to run the radiative transfer simulations. At this point, Paul indicates not knowing if the geolocation information had been updated during FIDUCEO processing. Turns to Martin for this question.
* Martin Burgdorf – The F10 satellite is not used in the analysis. Does not know if LECT drift was considered in FIDUCEO, but made an assertion that was probably not the case.

ACTION: Martin Burgdorf – Check with previous stewards of this FCDR to see if LECT drift was considered in the analysis.

**Action Post-meeting Update**: After verifying with Imke Hans (now at EUMETSAT) who had conducted the SSMT2 reprocessing in FIDUCEO, it is confirmed the geolocation information contained in the level-1b SSMT2 files (from NOAA CLASS) was not updated.

This calls for more information on the (defunct) DMSP satellite orbits and LECT, if one would want to improve this (noting however that F10 did not carry SSMT2, but there are other instruments of interest for passive microwave on F10).

Manik Bali – Have you accounted for scan-dependent bias?

* Paul Poli – We have not attempted to compute scan corrections yet.

ACTION: Paul Poli and Ed Kim – May have SSMT2 information in desk at NASA. Paul to send a reminder email to Ed to look for it.

**4) The Antenna Performance of AMSU-B and MHS in Flight - Martin Burgdorf (Hamburg University, Germany)**

*Note:*

Beam is not symmetric for Metop-C MHS.

*Questions:*

Cheng-Zhi – Is the point error changing with time or is there any systematic change?

* Martin - Does not know, and it is not obvious. In most cases any changes would be small, and difficult to detect changes. Also, the Metop-C time period is too short.

**5) AMSR3 Updates – Misako KACHI (JAXA)**

*Questions:*

Mark – Are you changing Ka band because of 5G radio frequency interference (RFI)?

* Misako – Engineers found a possible impact in the 36.5 GHz channel, which has led them to try to reduce the impact by narrowing the band width from 1000 MHz to 840 MHz.

Mark – Are there any plans to attempt to mitigate the RFI – e.g., on-board screening of data.

* Misako – We wanted to do this, but the schedule is too tight. There is great concern for a gap since AMSR-2 is past its life expectancy. The most expedient change was the change in band width.

Shengli – JAXA is decreasing the orbit altitude. The recurrence time is only three days or 44 orbits. Why was the observation frequency increased from 2 days to 3 days?

* Misako – The 3-day requirement follows TANSO-3 requirements, and thus it was changed.

**6) Progress on FY-3/MWRI FCDR - Shengli Wu (CMA)**

*Note:*

GMI treated as a reference sensor, as it has a good calibration system.

*Questions:*

Cheng-Zhi – There was an IEEE paper that discussed MWRI drift. The FY-2 seems to have smaller drift. Which parameter is most effective in removing this drift?

* Shengli - The calibration algorithm is quite complicated because of the extra antenna reflector dedicated to the warm load. There are no studies or analysis of this complex calibration system that go to this depth. In the current system, parameters related to the physical temperature of the instrument have an impact on the calibration. It could be related to this. Calibration related parameters that are a function of instrument temperature are now corrected.

Mark – Do you mean instrument temperature or warm load temperature?

* Shengli – Instrument temperature
* Cheng-Zhi – The instrument temperature and the target temperature are often correlated except during solar intrusions.

**7) Remote Sensing Journal Special Issue: Microwave Remote Sensing –Robbie Iacovazzi (NOAA)**

*Comments:*

Mark - There is no limitation to the number of pages.

*Questions:*

Ed – Are there other Special Issues with other journals that are being created that may overlap?

* Robbie – Yes. There is one open in IEEE.

Mark – Is there a page charge promotion if authors submit an article – e.g., a 25% discount?

* Robbie – There are two or three articles that can have page charges waived based on the discretion of the Guest Co-Editors. Does not know of any broad page charge discounts.

ACTION: Robbie to send out information about available special issue volumes surrounding microwave radiometery.

**8) Other Business**

Qifeng – Need to get information as early as possible on our workshop in May or June about “The future development of the satellite microwave remote sensing.”

Manik – There is an open action to the GSICS Research Working Group to discuss and document thoughts about using FCDRs as references. If you have not contributed to this, and have something to offer, please do so. Viju had conversations with Manik and plans to contribute.

ACTION (Before the 2021 GSICS Annual Meeting in March): All Subgroup Members working on FCDRs please provide input about using FCDRs as a community reference to Manik.

Qifeng – Collect all actions so the Subgroup can review them.

ACTION: Manik to aggregate GSICS actions applicable to the GSICS Microwave Subgroup.