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GLOBAL CLIMATE OBSERVING
SYSTEM (GCOS)

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**7th GRUAN Implementation-
Coordination Meeting (ICM-7)**

Session 2

Matera, Italy

23 February – 27 February 2015

Task Team progress report for February 2015 – Task Team Ancillary Measurements (TTAM)

(Submitted by Tony Reale and Thierry Leblanc)

Summary and Purpose of Document

Progress report from the task team Ancillary Measurements.

Task Team on Ancillary Measurements (TTAM) progress report as of Feb. 2015

SUMMARY

The task team on ancillary measurements oversee the production and integration of ancillary measurements, namely MWR, FTIR and ground-based lidar in compliance with GRUAN best measurement practices. Satellite observations also provide a source of ancillary measurement and their integration for use in overall validation, weather and climate applications is facilitated by the team. The composition of the task team remained unchanged over the past 12 months.

During 2014, procedures were implemented to begin access and collocation of GRAS GPSRO profiles and observations into NPROVS and NPROVS+ collocation datasets. Work continued to better integrate “uncertainty” analysis in routine satellite products validation including the added processing of “dedicated” RS92 RAOB, funded by NOAA, using GRUAN reference processing software. Progress continued toward procedures to compute site atmospheric state best estimates (SASBE) and associated SIGMA profiles for expanded sets of ancillary measurements from a given site using specific site recipe. Finally, over 6000 collocations of GRUAN and selected dedicated (w/S-NPP) RAOBs were added to NPROVS+ since ICM-6.

As part of the 2014 efforts towards future GRUAN Lidar data stream, a prototype version of the GRUAN Lidar Analysis Software Suite (GLASS) was developed. The software is capable of analysing raw signals of 9 different instruments, including 3 potential GRUAN lidar instruments (Payerne, Ny-Ålesund and Potenza), and 4 NDACC lidars. The current products of the GLASS are: water vapour, tropospheric ozone, stratospheric ozone, and temperature. No aerosol-related product is expected for the next 1 year. The GLASS uses the standardized definitions of vertical resolution and uncertainty recommended by the ISSI Team on NDACC Lidar Algorithms, as well as the recommended standardized approach for the propagation of these uncertainties through the data processing chain. The recommended approaches and definitions are compiled in the now-finalized ISSI Team Report, distributed this month to the NDACC Lidar Working Group for review and comments, and will be used to update and finalize the GRUAN Best Measurement Practices and Lidar Guidelines (expected June 2015).

For FTIR, Best Measurement Practices and Guidelines document is being written. A comprehensive review of the FTIR uncertainty budget for the MUSICA H₂O and HDO/H₂O products is given in Schneider et al. , 2012 (AMT, 5, 3007, 2012). A new paper reporting on a MUSICA validation campaign is Schneider et al., 2015 (AMT, 8, 483, 2015).

On the Microwave side, similar Best Measurement Practices and Guidelines documents are being written. The current draft version (V0.8) has Sections 1,2,3 completed. Sections 4-9 are currently being drafted. A complete draft version (V1.0) is expected by June 2015. A suitable data format compliant to NetCDF Climate and Forecast convention has been organized in the framework of the German HD(CP)2 Project . MWR data in Cabauw and Lindenberg (as well as other sites) are already processed based on this “Observation Data Product Standard”. A review of the MWR calibration and uncertainty budget is currently in progress within the EU COST Action TOPROF. In the TOPROF framework the Joint Calibration (J-CAL) experiment, a field test involving 5 colocated microwave radiometers, was performed in August 2014 at the premise of the LC in Lindenberg. A first version of the J-CAL scientific report is available. The final J-CAL scientific report is expected within the first half of 2015. Results from J-CAL as well as from the uncertainty budget analysis will be reported into the GRUAN MWR Guidelines.

See progress on individual action items starting next page.

PROGRESS ON CURRENT TASKS/ACTION ITEMS:

(action item numbers listed according to Master Action Item List available at:

<https://docs.google.com/spreadsheet/ccc?key=0Aq9hAcrcg9GtdEJDZkRWdGtUQXZ1YjZQNjjTLUUYUE&usp=sharing>)

Action Item 2: Retain collocated satellite radiances within (or linked) from the NPROVS+ archive for inter-radiance comparisons.

Main Contact: T. Reale **Due Date:** 3/2015 **Status:** Ongoing

Milestone: v1 Algorithm Support Dataset Created

Progress: Testing Underway

Issues: NETCDF, not publically available (yet), only for S-NPP

Action Item 3: Demonstration study of SASBE to include impacts of arbitrary mix of observations and spatial/temporal mismatch in context of climate monitoring and SAT cal/val; focus on temperature, H2O vapor profile and uncertainty propagation (SIGMA).

Main Contact: T. Reale, J. Dykema, D Tobin **Due Date:** 3/2015 **Status:** Ongoing

Milestone:

Progress: Identified for GRUAN Science Investigation (T. Gardiner)

Issues:

Action Item 4: Utility of NPROVS+ dataset management and graphical tool to support GRUAN (RAOB, AM, SASBE ...) "profile" developers

Main Contact: T. Reale, T. LeBlanc, **Due Date:** 12/2016 **Status:** re-defined

Milestone:

Progress: Topic for discussion within TTAM

Issues: New topic, original Action 4 (SASBE) merged into Item 3

Action Item 5: Report on use of satellite collocation data (NPROVS+) as QC/QA tool for GRUAN Data Products

Main Contact: T. Reale & M. Sommer **Due Date:** 3/2015 **Status:** Ongoing

Milestone: Preliminary tool completed

Progress: 2014 report to be presented ICM

Issues:

Action items 18: Report on FTIR best measurement practices and suitability of equipment (FTIR Guidelines)

Main Contact: J. Hannigan & M. Schneider **Due Date:** 12/2013 **Status:** Ongoing

Milestone:

Progress: Unfortunately there have been no actions in this respect during last year

Issues:

Action items 19: FTIR technical documentation (FTIR Guide) submitted for review by WG-GRUAN

Main Contact: TT-AM **Due Date:** 3/2015 **Status:** Ongoing

Milestone:

Progress: Unfortunately there have been no actions in this respect during last year

Issues:

Action items 20: Papers describing GRUAN FTIR products (MUSICA products) submitted for peer review

Main Contact: J. Hannigan & M. Schneider **Due Date:** 3/2015 **Status:** Publications
in AMT

Milestone:

Progress: Schneider et al. (2012): AMT, 5, 3007, 2012
Schneider et al. (2015): AMT, 8, 483, 2015

Issues:

Action items 21: Report on consistency between FTIR and IASI retrievals of products for H2O and HDO/H2O

Main Contact: M. Schneider **Due Date:** 12/2016 **Status:** Publications
in AMT

Milestone:

Progress: Wiegele et al. (2014): AMT, 7, 2719, 2014
Schneider et al. (2015): AMT, 8, 483, 2015

Issues:

Action items 22: Data flow through NCDC portal

Main Contact: LC and TT-AM **Due Date:** 9/2015 **Status:** Not started

Milestone:

Progress: No progress for NCDC portal, but submission to NDACC database is in preparation. It is still not finished due to some discussions on the modification of the metadata standard needed for the MUSICA data.

Issues:

Action items 23: Assessment of data usage, issues and potential improvements for this data stream

Main Contact: TT-AM **Due Date:** 12/2016 **Status:** Not started

Milestone:

Progress:

Issues:

Action items 39: Inventory of AERI instruments to be compiled for TTAM consideration and report to GRUAN community on viability to bring AERI into GRUAN.

Main Contact: M. Schneider & J. Hannigan **Due Date:** 2/2013 **Status:** Ongoing

Milestone:

Progress:

Issues:

Action items 24: Report on microwave radiometer best measurement practices and suitability of equipment (Microwave Radiometer Guidelines)

Main Contact: N. Cimini **Due Date:** 3/2015 **Status:** Ongoing

Milestone: Version 0.8 delivered before ICM-7.

Progress: Sections 1, 2, 3 are nearly completed. Sections 4-9 are being drafted.

Issues: Behind schedule

Action items 25: Inventory of potential microwave radiometer instruments for use in GRUAN (first version with semi-annual updates)

Main Contact: N. Cimini **Due Date:** Recurring **Status:** Ongoing

Milestone: Version 0.1 will be delivered after ICM-7.

Progress: Most of the actual GRUAN sites have been inventoried.

Issues: None

Action items 26: Report on validation strategies and results for microwave radiometers

Main Contact: N. Cimini

Due Date: 12/2015 **Status:** Ongoing

Milestone:

Progress: Validation statistics are available for some GRUAN sites and will be reported on GRUAN microwave radiometer guidelines. Observation minus model background (O-B) statistics at selected GRUAN sites are planned within the EU COST Action TOPROF (a focused sub-WG meeting is scheduled for March 2015).

Issues: None

Action items 27: Microwave radiometer technical documentation (Microwave Guide) submitted for review by WG-GRUAN

Main Contact: TT-AM

Due Date: 6/2015 **Status:** Just started

Milestone: Version 0.8 delivered before ICM-7. Version 0.8 is uncompleted.

Progress:

Issues:

Action items 28: Paper describing the GRUAN Microwave radiometer product submitted for peer review

Main Contact: N. Cimini & N. Kampfer

Due Date: 7/2015 **Status:** Not started

Milestone:

Progress:

Issues:

Action items 29: Data flow through NCDC portal

Main Contact: LC & TT-AM

Due Date: 9/2015 **Status:** Not started

Milestone:

Progress:

Issues:

Action items 30: Assessment of data usage, issues and potential improvements for this data stream

Main Contact: TT-AM

Due Date: 12/2016 **Status:** Not started

Milestone:

Progress:

Issues:

Action items 31: Technical documentation for GRUAN Lidar stream (Lidar Guide) submitted for review by WG-GRUAN

Main Contact: T. Leblanc and TT-AM

Due Date: 12/2014 **Status:** Stalled

Milestone: When published as WMO/GRUAN TD

Progress: Version 1 written, revised version expected fall 2015

Issues: No progress in 2013 2014, but alignment with new GLASS now in progress

Action items 32: Paper describing GRUAN lidar products submitted for peer review

Main Contact: T. Leblanc and TT-AM

Due Date: 6/2015 **Status:** Not started

Milestone: When published

Progress: Awaiting completion of GLASS and GRUAN TD

Issues:

Action items 33: Report on lidar products and uncertainty budgets developed by the ISSI Team on NDACC lidar algorithms.

Main Contact: T. Leblanc **Due Date:** 12/2014 **Status:** Ongoing
Milestone: 2015: Expected publication
Progress: Almost complete; Report finalized, to be reviewed by NDACC LWG
Issues: Slow progress due to lack of time availability

Action items 34: Report on lidar best measurement practices and suitability of equipment (Lidar Guidelines)

Main Contact: T. Leblanc **Due Date:** 12/2014 **Status:** ??
Milestone: ??
Progress: ??
Issues: Not sure what this item is for (isn't it covered in items 31-33?)

Action items 35: Report at ICM5 on status of EARLINET centralized data processing algorithm and possible synergies between EARLINET and GRUAN.

Main Contact: A. Apituley **Due Date:** 4/2015 **Status:** Ongoing?
Milestone: ??
Progress: ??
Issues: Arnoud, could you address this please? Thanks

Action items 36: Report on progress towards developing a LIDAR data stream including run clients and uncertainty estimates.

Main Contact: T. Leblanc **Due Date:** 2/2015 **Status:** Ongoing
Milestone: When data stream is fully linked together (2015)
Progress: GLASS, 80% done, LidarRunClient 50%, Data Management: 0%
Issues: Slow progress due to lack of time availability

Action items 37: Data flow through NCDC portal

Main Contact: LC and TT-AM **Due Date:** 9/2015 **Status:** Not started
Milestone: When data stream is fully linked together (2015)
Progress:
Issues:

Action items 38: Assessment of data usage, issues and potential improvements for this data stream

Main Contact: T. Leblanc and TT-AM **Due Date:** 12/2016 **Status:** Not started
Milestone:
Progress:
Issues: