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Task Team progress report for June 2017 – Task Team Ancillary Measurements (TTAM)

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Summary and Purpose of Document

Progress report from the task team Ancillary Measurements.

Task Team on Ancillary Measurements (TTAM) progress report as of June 2017

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.

The setup of the GRUAN Lidar Data Stream remained slow through 2016 and the first half of 2017 (lack of time availability). As part of the 2017 efforts, a version 1 of the GRUAN Lidar Analysis Software Suite (GLASS) was developed. The software is capable of analysing raw signals from different instruments, including 3 potential GRUAN lidar instruments (Payerne, Ny-Ålesund and Potenza), and 4 NDACC and 3 TOLNet lidars. The current products of the GLASS are: water vapour, tropospheric ozone, stratospheric ozone, and temperature. No aerosol-related product is expected until end of 2017. A full framework of metadata ingestion is now in place with GLASS v1. More than 100 instrument and analysis parameters are now ingested, with the option, for each parameter, to be overridden by using optional keywords during runtime (IDL). All parameters are instrument-dependent and time-dependent, making the analysis and re-analysis very versatile. However, once a specific date/time is selected, the instrument parameters are unique. On the other hand, multiple analysis configurations can be called, depending on the type of science application needed. . GLASS v1 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 (see ISSI Team Report available at http://www.issibern.ch/teams/ndacc/ISSI_Team_Report.htm, and the 3 AMT companion papers published in August 2016, doi:10.5194/amt-9-4029-2016; doi:10.5194/amt-9-4051-2016; doi:10.5194/amt-9-4079-2016). There are currently 3 incomplete components in the GRUAN Lidar Data Stream: 1) LidarRunClient interface, 2) the full integration of GLASS in the GRUAN IT environment, and 3) full documentation. The development of the lidarRunClient will resume the third week of June 2017. It will be followed by an integration of the GLASS in the GRUAN IT environment (Oct 2017), and by the writing of the full documentation (early 2018).

There is no progress in the potential development of GRUAN FTIR products. In the second half of 2017, FTIR POC will be contacted for a re-evaluation of the potential use of FTIR measurements in GRUAN.

Regarding the microwave technique, a first version of the Best Measurement Practices and Guidelines document was released in early 2017. The current draft version has received some comments and will be revised after some higher priority activities within GAIA-CLIM and TOPROF are completed.

Discussions and plans to integrate Ancillary Measurement data-streams to support RS92 to RS41 transition in the context of UT moisture (dry) bias analysis and stratospheric temperature radiation induced error adjustments have been discussed over the past year. These have focused on the use of lidar data (and also MWR for moisture?). Unfortunately, routine AM data-streams are not a reality except on a limited basis (Table-Mountain and Payerne withstanding). Opportunity to include AM data-streams in conjunction with proposed RIVAL (Radiosonde Intercomparison and Validation) studies at ARM sites to help manage RS92 to 41 transition have had peripheral consideration and is enticing as these observations would also be (in part) synchronized with polar and GPSRO overpass. This potentially follows the discussions of combined AM (including satellite) and radiosonde observations in the context of implementing "routine" SASBE's at GRUAN sites as part of the "scheduling" WG under Tom Gardiner. Again, the

progress here is slow with a primary issue being what can AM bring to the SASBE table and how would AM processing at GRUAN sites be undertaken to meet the SASBE goal. Again, the bigger question is what does SASBE bring to the table. Such discussions have also been of interest within the G-MAC , specifically, the use of Lidar (and MWR) from Beltsville (Whiteman and Belay…) combined with the satellite synchronous radiosondes launched at Sterling and Beltsvile (G-MAC). Capability exists (in principle)within NOAA/STAR NPROVS+ to access available AM, radiosonde and satellite (sounding and radiances) profiles to analyze their consistency/agreement (Immler) from a given site, including in a SASBE context. Connection with GAIA-CLIM in these areas are imminent.