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**3rd GRUAN Implementation-
Coordination Meeting (ICM-3)**
Queenstown, New Zealand
28 February – 4 March 2011

Session 4

Task Team 1 (Radiosonde) progress report 01/2011

(Submitted by Masatomo Fujiwara and Franz Immler)

Summary and Purpose of Document

Progress report from the task team 1 (Radiosonde) covering first period till 01/2011.

Progress Report

Task Team 1. Radiosonde

Prepared by Masatomo Fujiwara and Franz Immler

3 February 2011

1. The membership of the team has been settled (29 October 2010), and the Terms of Reference document has been completed and published on the GRUAN website (November 2010).
2. A draft task list had been prepared by the co-chairs with some help by Larry Miloshevich and was circulated within the team (24 January 2011). See the Appendix. It is now under review by the team members. The co-chairs are expecting to finalize it after the ICM-3 and publish it through the GRUAN blog. <Any comments/suggestions/inputs from the Working Group by the ICM-3 are most welcome!>
3. Some tasks are currently in progress:
 - (1) Evaluation of the “science payload” data taken from the CIMO intercomparison (F. Immler, M. Fujiwara + J. Wang + H. Voemel)
 - (2) Further tests of Meisei Temperature Reference (MTR) in Lindenberg in November 2010
 - (3) Review of different time lag correction schemes for Vaisala RS92 humidity measurements (A. Kats, L. Miloshevich, and F. Immler)
 - (4) Review of the RS92 GRUAN product prepared by the Lead Center (starting soon)
 - (5) Review of the CFH/NOAA FPH/Snow White uncertainty product (starting soon)

Appendix.

Email message from the co-chairs to the members on 24 Jan 2011 regarding a draft task list.

From: Masatomo Fujiwara <fuji@ees.hokudai.ac.jp>

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Cc: fuji@ees.hokudai.ac.jp, <holger.voemel@dwd.de>, <Peter.Thorne@noaa.gov>

Subject: Task Team Radiosonde: Draft task list

Date: Mon, 24 Jan 2011 12:07:46 +0900

Dear Task Team Radiosonde members,

(CC: Holger Voemel, & Peter Thorne)

Attached please find version 1.0 draft task list for our team. I and Franz prepared this "draft" (or a skelton or an idea list) to get your further comments/suggestions/thoughts.

Could you read through this draft and send your comments to the whole team (or to me and Franz if you like) by February 18, 2011?

We would like to complete the task list by mid-March and start to work on some specific items. We will re-consider and revise the task list about half a year later (i.e., around September-October 2011).

One of the important points/questions for you is that we would like each of you to choose one (or more if you like) task to lead. The leader would lead the discussion/reviewing for a particular task item, and become a leading author of the summary/recommendation report to WG-ARO. The leader could be like an editor, coordinating the task to produce the final product (i.e., a report).

Any questions/suggestions/comments are all welcome!

Thank you very much for your collaboration!

With my best wishes,

Masatomo

Task Team Radiosonde
Draft Task List

Version 1.0: January 20, 2011 (prepared by Masatomo Fujiiwara and Franz Immler)

This Draft Task List intends to summarize the items on which the task team will work.

- (1) within about half a year (“Very High (VH) priority”, necessary from the beginning of the GRUAN measurements; coming very soon),
- (2) within 2-3 years (“High (H) priority”, necessary from the first phase of the GRUAN measurements), and
- (3) in the future (“Low (L) priority”; the items that should be within the scope of our task team but not for near future).

This is a kind of more specific and detailed Terms of Reference. Please see the Terms of Reference for the summary of the general tasks of our team.

This could also be used for the information exchange/sharing within the task team members.

- Please propose/add other items if you think necessary! Please give your general comments/suggestions on, e.g., how we actually approach efficiently.
- The co-chairs would like to have volunteers within the task team members to lead each of the “VH priority” items. Please! (for VH items only at this moment.)
- (Note that the VH items with a specific deadline at the “when” column may be experimental ones where we try to find the best approach as a team.)
- Deadline: February 18, 2011 (please let us know if you need more time.)

Explanation of Each Column of the following tables is as follows:

Priority: Very high (VH), High (H), Low (L)

Parameter: Pressure (P), temperature (T), water vapor (WV), relative humidity (RH), GPS altitude (GPS-ALT), geopotential height (GPH), horizontal winds (U&V), etc.

Task: Explanation of the task

By Whom: TT (Task Team) (and we will specify the person who will lead the task)

When: Target completion date

Notes:

(1) The “Very High” priority items, within half a year (coming soon)

Priority	Param.	Task	By Whom	When	Notes
VH	T, RH, P, GPH, U&V	REVIEW (AND MAKE RECOMMENDATIONS FOR GRUAN COMMUNITY) of the Lead Centre document for the GRUAN Vaisala RS92 data product (including the pre-launch sensor quality check procedures) prepared by the Lead Centre	TT members (led by the co-chairs)	March 2011?	The document ready in February? 2011; some overlaps with the following, second item (RS92 RH time-lag and mean-bias corrections)
VH	RH	REVIEW (AND MAKE RECOMMENDATIONS FOR GRUAN COMMUNITY) of the time-lag and mean-bias correction algorithms for Vaisala RS92 RH sensor by Miloshevich et al. (http://milo-scientific.com/prof/radiosonde.php), by Kats et al., and by Immmler et al. (GRUAN Lead Centre); summarized by Kats, Immmler, and Miloshevich	TT members (led by the co-chairs)	March 2011 ?	Related with the above, first item (GRUAN RS92 data product document)
VH	T	REVIEW of the data analysis of the Lindenberg Meisei Temperature Reference (MTR) campaign in November 2010 prepared by GRUAN Lead Centre and Meisei (see Shimizu and Hasebe, AMT, 2010: http://www.atmos-meas-tech.net/3/1673/2010/amt-3-1673-2010.html)	TT members (led by the co-chairs)	April 2011 ?	Recommendations for pre-launch checks, data processing and QA/QC as well
VH	All	Set up a password-protected server website where all relevant papers could be collected for easy access by the team members (at Lead Centre?)	Lead Centre	As soon as possible	

Priority	Param.	Task	By Whom	When	Notes
VH	T, WV/RH	<p>REVIEW (AND MAKE RECOMMENDATIONS FOR GRUAN COMMUNITY) of the report from the 8th WMO Intercomparison of Radiosonde Systems (Jul.-Aug. 2010, Yangjiang, China), the part for temperature and water vapor/relative humidity sensors on the “Science” payloads written by Voemel, Immler, Wang, and Fujiwara</p> <p>(Temperature Sensors: Vaisala RS92, Meisei Temperature Reference (MTR), Meisei operational (RS06G), Lockheed Martin (LM) Sippican Multithermistor, and GRAW operational)</p> <p>(WV/RH Sensors: Cryogenic Frostpoint Hygrometer (CFH), Vaisala RS92, GRAW operational, Meisei operational (RS06G), LM Sippican operational, (Meteolabor Snow White), and (Vaisala RD100))</p>	TT members (led by ?)	June 2011	<p>The official WMO report will be published in May 2011.</p> <p>Then, Voemel et al. will consider a journal publication.</p> <p>NOTE: This and the next item are within a single WMO report.</p>
VH	P, T, RH, GPS-ALT, GPH, U&V, etc.	<p>REVIEW (AND MAKE RECOMMENDATIONS FOR GRUAN COMMUNITY) of the report from the 8th WMO Intercomparison of Radiosonde Systems, the part for all sensors on the “operational” payloads written by WMO/Commission on Instruments and Methods in Observations (CIMO) (Nash et al.)</p> <p>(Radiosondes: CHANGE, DAQIAO, GRAW, HUAYUN, Internet South Africa, Jinyang, Meisei, Meteolabor (including Snow White), MODEM, LM Sippican, Vaisala)</p>	TT members (led by ?)	June 2011	<p>The official WMO report will be published in May 2011.</p> <p>Note: This and the previous item are within a single WMO report.</p>

Priority	Param.	Task	By Whom	When	Notes
VH	T	REVIEW of the uncertainty estimation of NASA ATM (Accurate Temperature Measuring) sonde (using the multi-thermistor technique) by Schmidlin et al.	TT members (led by ?)		Recommendations for pre-launch checks, data processing and QA/QC as well
VH	T	REVIEW of the uncertainty estimation of LM Sippican Multithermistor sonde by Fujiwara et al. (?) based on 8th WMO Intercomparison	TT members (led by ?)		This might not be included in the official WMO report
VH	WV	REVIEW of the uncertainty estimation of Meteolabor Snow White based on existing literature, etc. (Snow White sensor itself & Snow White radiosounding system)	TT members (led by Philipona)		Recommendations for pre-launch checks, data processing and QA/QC as well
VH	WV	REVIEW of the uncertainty estimation of Cryogenic Frostpoint Hygrometer (CFH) based on existing literature, etc. (CFH sensor itself & CFH radiosounding system)	TT members (led by Fujiwara)		Recommendations for pre-launch checks, data processing and QA/QC as well
VH	WV	REVIEW of the uncertainty estimation of NOAA Frost Point Hygrometer (FPH) based on existing literature, etc. (FPH sensor itself & FPH radiosounding system)	TT members (led by Fujiwara)		Recommendations for pre-launch checks, data processing and QA/QC as well

(2) The “High” priority items, within a few years

Priority	Param.	Task	By Whom	When	Notes
H	WV	REVIEW of the uncertainty estimation of FLASH-B (Fluorescent Advanced Stratospheric Hygrometer for Balloon) based on existing literature, etc. (FLASH-B sensor itself & FLASH-B radiosounding system as well)	TT members (led by Fujiwara)		Recommendations for pre-launch checks, data processing and QA/QC as well
H	WV	REVIEW of the AquaVIT summary document (AquaVIT is a chamber experiment of 16 UT/LS water vapor sensors (including CFH, FLASH-B, and Snow White) using the German AIDA chamber in 2007) A “white paper” is available from: https://aquavit.icg.kfa-juelich.de/WhitePaper/ (At the moment, they have no definite plan to write up a journal paper.)	TT members (led by Fujiwara)		This work gives us good lessons about uncertainty estimation and SI traceability for UT/LS water vapor sensors
H	P	Meteorolabor Hypsometer versus GPS (versus other, classical method)	TT members (led by Philipona?)		Recommendations for data processing and QA/QC as well
H	P, T, RH, GPS-ALT, U&V	REVIEW of the uncertainty estimation of GRAW radiosonde by GRUAN Lead Centre and Graw (based on some experiments at Lindenbergtg)	TT members (led by ?)		Recommendations for data formats as well. Note: At the WMO Intercomparison, their RH sensor is found to be of fast response

Priority	Param.	Task	By Whom	When	Notes
H	All	REVIEW of the instrumentation change strategy for climate monitoring	TT members (led by ?)		JMA is now making dual soundings of Meisei/RS92
H	Flight system	Influence/effects of using the auto-launcher system (particularly for Vaisala RS92)			Work with LC to gather information on the statistics from GRUAN sites
H	Flight system	The use of descent data			Recommendations for data processing and QA/QC as well
H	Flight system	Satellite overpass by balloon sounding (past experiences from validation activities for UARS, A-train, etc., usefulness and limitation, and recommendations for GRUAN)			Inputs from the GRUAN Analysis Team for Network Design and Operations Research (GATNDOR; Seidel et al.)?

(3) The “Low” priority items but within the scope of this task team

Priority	Param.	Task	By Whom	When	Notes
L	Flight system	A better unwinder?			30 m unwinder might not be enough. 120 m? proposed by Shimizu and Hasebe, AMTD, 2010 Work with GRUAN sites
L	Flight system	A better parachute?			Work with GRUAN sites
L	Ozone	GATHER INFORMATION on existing working groups/task teams for ozonesondes (GAW, JOSIE, WOUDC, SHADOZ, etc.) and communicate with them	Co-chair		
L	CO2	SEARCH for new balloon-sounding technology	TT members		e.g, NOAA “air core”, Japanese CO2 sonde, etc.
L	CH4	SEARCH for new balloon-sounding technology	TT members		

Priority	Param.	Task	By Whom	When	Notes
L	Radiation	Radiation: net radiation, incoming shortwave radiation, outgoing shortwave radiation, incoming longwave radiation, outgoing longwave radiation, and radiance) SEARCH for new balloon-sounding technology	TT members		BSRN covers them? Multithermistors might provide some of them?
L	Aeorosols	(aerosol optical depth, total mass concentration, chemical mass concentration, light scattering, light absorption) SEARCH for new balloon-sounding technology	TT members		e.g., Swiss COBALD, Japanese Optical Particle Counter sonde, etc.
L	Clouds	(cloud amount/frequency, cloud base height, cloud layer heights and thicknesses) SEARCH for new balloon-sounding technology	TT members		cf. NCAR replicator, Japanese videosonde/HYVIS, COBALD?, etc.
L	Flight system	Improved balloon technology? (Is ~35 km altitude the theoretical limitation for balloon sailing?; A technological limitation currently narrows our target to the region below the middle stratosphere...)			
L	Flight system	Auto-returning, self-recovering upper air in situ sounding system? (Find a way to avoid the “garbage/trash” problem which is always the criticism for balloon sounding) e.g., “Brainstorming: New methods and technologies for advanced in-situ water vapor profiling, Thursday, December 11, 2008” (please search with these words)			