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Coordination Meeting (ICM-9)**

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Session 3

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## Task Team Progress Report for June 2017– Radiosondes

*(Submitted by Rolf Philipona and Masatomo Fujiwara)*

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### **Summary and Purpose of this Document**

Progress report from the task team on Radiosondes.

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## Task Team progress report for June 2017 – Radiosonde

### SUMMARY

*We have several member changes. Ruud Dirksen has been replaced with Christoph von Rohden as the LC representative in September 2016. Nobuhiko Kizu has been replaced with Masami Iwabuchi as the contributor from the JMA/Tateno site in May 2017. Very sadly, Alexander (Sasha) Kats has passed away on 22 May 2017. Finally, Rolf Philipona has stepped down as the co-chair and left the team as he retired from MeteoSuisse in May 2017. We have several tasks, some of which have good progress.*

*This table shows the current members of the team.*

Name	Affiliation	Status
Masatomo Fujiwara	Hokkaido University, Japan	Co-chair
Christoph von Rohden	GRUAN Lead Centre, DWD, Germany	
Frank Schmidlin	USA	
Hannu Jauhiainen	The Association of Hydro-Meteorological Equipment Industry; Vaisala, Finland	HMEI representative
Micheal Hicks	NOAA/NWS/OOS, USA	
Larry Miloshevich	MILO-Scientific, USA	
Rigel Kivi	Finnish Meteorological Institute, Finland	
Masami Iwabuchi	Japan Meteorological Agency, Japan	
Yang RongKang	China Meteorological Administration, China	
Martial Haeffelin	Institut Pierre Simon Laplace, France	

### PROGRESS ON THE MAIN TASKS

**Task:** *Assess the effects of the use of auto-launchers compared to manual launches on measurement uncertainty estimates for radiosondes.*

**Main Contact:** *Rigel Kivi, Fabio Madonna, Martial Haeffelin, Masami Iwabuchi, (Masatomo Fujiwara)*

**Due Date:** *31-Dec-2017 (updated)*

**Status:** *Ongoing*

**Milestone:** *Publication in the peer reviewed literature.*

**Progress:** Information has been summarized for Sodankyla (Kivi), Potenza (Madonna), and Tateno (Kizu). Information from French sites will also be added. Still in the process to finalize the analyses.

**Issues:** At ICM-8 in Boulder, the publication of results in peer-reviewed literature was constrained to the availability of the results from a dedicated experiments with the auto launcher proposed by Fabio Madonna and to be performed at Potenza station. Unfortunately, since August 2016, all the launches at Potenza station are performed manually given that the autosonde has been put in “quiescent” state due to lack of funding to perform its maintenance and its mandatory update. Upon discussion with Rigel Kivi, I proposed to have a first paper published as soon as possible with the results already shown by Rigel in the past and to offer our support to perform dedicated experiments on the auto-launcher at other stations than Potenza.

**Task:** Assess multi-payload launch configurations for GRUAN usage.

**Main Contact:** Hannu Jauhiainen and Masatomo Fujiwara

**Due Date:** (new target and new deadline to be set at ICM-9)

**Status:** A GRUAN TD manuscript was completed and submitted to LC in June 2017

**Milestone:** Document detailing the issues surrounding multi-payload soundings to be drafted and submitted either to peer reviewed literature (first choice) or to WG-GRUAN for review as a TD

**Progress:** The description of various methods for Vaisala RS41-RS92 dual flights was added, and a GRUAN TD manuscript was completed and submitted to LC in June 2017.

**Issues:** The second phase would be to encourage sites and researchers to make quantitative studies with several soundings of the same set of instruments with different flight configurations. This would be feasible for two operational radiosonde intercomparison flights (e.g., LC’s test flights for RS41 and RS92), but would be doubtful for much heavier and complicated payloads.

**Task:** Amendments to the Manual on Codes (WMO No. 306) for BUFR (transmitting uncertainties, etc.).

**Main Contact:** Masatomo Fujiwara, Nobuhiko Kizu, Task Team Radiosonde, Task Team Sites, Lead Centre, WMO CBS. (Alexander Kats had been the lead until mid May 2017)

**Due Date:** (Not clear at this moment as there are several steps to reach the goal – to be discussed at ICM-9)

**Status:** Ongoing

**Milestone:** GRUAN metadata and uncertainty data are transmitted through the

*Global Telecommunication System as BUFR*

**Progress:** Alexander Kats made the official procedure to make the amendments to the BUFR. As of 3 May 2017 the four new information (0 02 088 Volume of gas used in balloon; 0 03 027 Type of flight rig Code; 0 08 037 Baseline check significance; 0 08 038 Instrument data significance) can be sent with the BUFR code. In the meantime Alexander Kats has published, as one of the coauthors, the following paper: Ingleby et al. (2016), "Progress towards high-resolution, real-time radiosonde reports", BAMS, <http://doi.org/10.1175/BAMS-D-15-00169.1>

**Issues:** We miss the strong leadership on this by Alexander (Sasha) Kats who passed away in May 2017. He made the great first step, i.e., to demonstrate how to make the amendments to the existing BUFR code (Note the time required: Sasha officially proposed the amendments at the IPET-DRMM IV meeting in June 2016, and they became in effect in May 2017). The next step would be that the GRUAN community discuss and determine the information that need to be added to the BUFR code (in practice, we would start with the metadata for the GRUAN Data Product – Sasha tried to do this in last March), make the official proposal, work with the manufacturer to modify the ground receiving software, and encourage the sites to send the information through the GTS with BUFR.

**Task:** Assess time lag in Vaisala RS92 humidity corrections, comparing the GRUAN processing to other published approaches.

**Main Contact:** Ruud Dirksen with assistance from Christoph von Rohden, Michael Sommer, Larry Miloshevich, and Masatomo Fujiwara

**Due Date:** 3-April-2018 (changed)

**Status:** Ongoing

**Milestone:** Manuscript describing the results of the humidity time lag assessment submitted to a journal.

**Progress:** Test calculations were made by Larry Miloshevich and by Ruud Dirksen. Restarted in late 2014, after the publication of Dirksen et al. (AMT, 2014) on description of the GRUAN Vaisala RS92 data product version 2. [NEW] Lead Centre has performed extensive experiments to determine the time lag in the laboratory facilities in Lindenberg (for RS92 and for RS41). These lab-data need to be analyzed, and the resulting newly derived time lag constants should then be evaluated by applying them to real sounding data. This is also relevant in view of the development of GRUAN data processor v3.

**Issues:** None.

## **NOTES ON OTHER TASKS**

(The primary contact for these tasks is the Lead Centre or other body. The Task Team Radiosonde is to help and support their work.)

**Task:** *GRUAN Radiosonde Omnibus/generic Technical Document.*

**Main Contact:** *Christoph von Rohden, with the help of June Wang, Greg Bodeker, Masatomo Fujiwara, and others*

**Due Date:** *31-Dec-2017*

**Status:** *Ongoing*

**Milestone:** *Manuscript prepared for review by the GRUAN WG.*

**Progress:** *A draft is written.*

**Issues:** *None.*

**Task:** *RS92 GRUAN Data Product version 3 with new radiation correction.*

**Main Contact:** *Lead Centre, Task Team Radiosonde, Task Team Ancillary Measurements.*

**Due Date:** *31-Dec-2017*

**Status:** *Ongoing*

**Milestone:** *RS92 GRUAN Data Product version 3 will be created that includes a new radiation correction.*

**Progress & Issues:** *Main reason for delay is difficulties in interpreting/understanding the radiation experiments for RS92. As a result of this no radiation correction for RS92 available yet. The radiation correction is a critical component of the data processor.*

**Task:** *GRUAN Technical Documents for non-RS92 radiosondes.*

**Main Contact:** *Relevant sites and Task Team Radiosonde.*

**Due Date:** *(Different groups are working separately with their own target deadlines.)*

**Status:** *Ongoing*

**Milestone:** *GRUAN TDs for Meisei, Modem, Meteolabor, and other manufacturers' radiosondes are written up.*

**Progress:** *A GRUAN TD for Meisei RS-11G and iMS-100 radiosondes (including the review process) has been nearly completed in June 2017.*

**Issues:**

**THE FOLLOWING TASKS ARE THOSE FROM LAST YEAR'S REPORT.**

(Again, the primary contact for these tasks is the Lead Centre or other body. The Task Team Radiosonde is to help and support their work.)

**Task:** *Define the non-RS92 data collection client requirement, identify the central data processing facility, and initiate data flow.*

**Milestones:** *Assessments of non-RS92 data collection client requirements. Data flow through NCDC portal*

**Task:** *Develop a UT/LS water vapour data product supported by appropriate technical documentation. The technical documentation must account for operation of CFH, NOAA FPH, Snow White and possibly FLASH-B.*

**Milestone:** *Technical documentation completed for frostpoint hygrometer measurements. Peer reviewed publication on frost point hygrometer GRUAN data product submitted.*

**Issues:** *LC together with Holger Vömel has published a paper on the uncertainty of the CFH sensor:*

*Vömel, H., Naebert, T., Dirksen, R., and Sommer, M.: An update on the uncertainties of water vapor measurements using cryogenic frost point hygrometers, Atmos. Meas. Tech., 9, 3755-3768, doi:10.5194/amt-9-3755-2016, 2016.*

<http://www.atmos-meas-tech.net/9/3755/2016/amt-9-3755-2016.html>

**Task:** *Finalize the definition of GRUAN data products for RS92 radiosondes: Technical document describing pre-launch procedure (TD5)*

**Milestone:** *Review of the pre-launch ground-check/ground-calibration procedures*

**Task:** *Define the ozonesonde data collection client requirement, identify the central data processing facility, and initiate data flow.*

**Milestone:** *Data flow through NCDC portal. Assessment of data usage, issues and potential improvements for this data stream.*