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**11th GRUAN Implementation-  
Coordination Meeting (ICM-11)**

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Session 3

Singapore

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## Task Team Progress Report for April 2019 – Radiosondes

*(Submitted by Masatomo Fujiwara and Christoph von Rohden)*

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

Progress report from the task team on Radiosondes.

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## Summary

Some tasks had good progress. Bruce Ingleby of ECMWF became a member in April 2019.

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	Co-chair
Frank Schmidlin	NASA Retiree, USA	
Hannu Jauhiainen	The Association of Hydro-Meteorological Equipment Industry Vaisala, Finland	
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	
Sergey Kurnosenko	Scientific Software Consultant, USA	
Bruce Ingleby	ECMWF, UK	

## Progress on main tasks

**Task:** Assess the effects of the use of auto-launchers compared to manual launches on measurement uncertainty estimates for radiosondes [Highest Priority Task #3]

**Main Contact:** Masatomo Fujiwara, Fabio Madonna, Rigel Kivi, and the auto-launcher task team

**Due Date:** August 2018 to define small set of well posed questions to be addressed. December 2018 to submit manuscript or report

**Status:** Ongoing, with good progress

**Milestone:** Publication in the peer reviewed literature or a technical report

**Progress & Issues:** At the ICM-10 in April 2018, Masatomo Fujiwara became the coordinator and formed a team with people from several relevant GRUAN sites. After the ICM-10, these sites provided their experiences with the auto-launcher systems. Miguel Hernandez and Masatomo Fujiwara are summarizing that information. Bruce Ingleby provided the observation-minus-background statistics for some sites for RS92 data in 2015-2016. Jean-Charles Dupont has finished manual-autolauncher intercomparison flights at Faaa, Tahiti with the Modem system, and Fabio Madonna has analyzed that data set. Rigel Kivi is updating his analysis of the Vaisala system at Sodankyla. Masami Iwabuchi and Masatomo Fujiwara summarized the information from eight (non-GRUAN) JMA autolauncher stations. Fabio Madonna has started to write a draft in February 2019.

**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-11)

**Status:** A GRUAN TD manuscript was published in January 2019 as GRUAN TD-7 (<https://www.gruan.org/documentation/gruan/td/gruan-td-7/>).

**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:** (New target is being considered now).

**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., LCs test flights for RS41 and RS92, Tatenos flights for RS92 and RS-11G (and iMS-100)), but would not be easy for much heavier and complicated payloads.

## NOTES ON OTHER TASKS

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

**Task:** GRUAN Radiosonde Fundamental Technical Document

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

**Due Date:** January 2019

**Status:** Ongoing

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

**Progress:** A draft has been written.

**Issues:** None.

**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:**

1. The GRUAN TD No. 5 for Meisei RS-11G and iMS-100 radiosondes was published in March

2018. A paper manuscript on Meisei RS-11G (i.e., comparison its GDP with RS92 GDP) has been submitted to AMT (Kobayashi et al., <https://www.atmos-meas-tech-discuss.net/amt-2018-416/>).

2. A manuscript for the Modem M10 radiosonde has been submitted (Dupont et al., J. Atm. Ocean. Tech).

**Issues:** None

**Task:** RS92 GRUAN Data Product version 3 (with new radiation correction; & time lag correction intercomparisons for Vaisala RS92 humidity) for Vaisala RS92 humidity)

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

**Due Date:** (To be discussed at the ICM-11)

**Status:** Ongoing

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

**Progress & Issues:**

1. It was found at the LC that the existing experimental setup for solar radiative heating effects on temperature measurements has number of conceptual deficiencies. Thus, the LC has developed a completely new extended setup and started first set of tests in April 2018. Data from new experiments will be used for the radiation correction parameterizations for the next versions of the GDP. (Also, intercomparisons of various time lag correction methods for Vaisala RS92 humidity were to be completed and published; this is currently on hold.)
2. The RS41-processing system (currently in alpha development state by LC, see task RS41 GRUAN Data Product) is largely generalized to be customizable to RS92 and other sondes.
3. (3) LC has a cooperation with Korea Research Institute of Standards and Science (KRISS, thermometry department, Dr. Kim Young-Gyoo). They are in the process of developing a reference-type radiosonde (Double Thermistor Radiosonde), and constructed and developed further a complex setup for measurements of the radiation effect on radiosonde sensors. Christoph and Ruud visited KRISS in December 2018 and made some radiation tests with RS92 for comparison with existing LC data. It is in GRUANs interest to know that this radiosonde test facility exists. Further cooperation is sought.

**Task:** RS41 GRUAN Data Product

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

**Due Date:** March 2019

**Status:** Ongoing

**Milestone:** RS41 GRUAN Data Product will be created.

**Progress & Issues:**

1. A first version of the data product (RS41-GDP-ALPHA.1) was completed on 08 Feb, 2019 (Michael, Christoph). The processing works; GRUAN RS41 profiles since 01 Jan, 2019 were processed for first testing and debugging. An Alpha2 version is planned for the beginning of March 2019, including a basic documentation, which will be made available within GRUAN for internal evaluation and testing. Several important issues still have to be revisited or resolved before creation of an evaluable or publishable Beta-version (humidity time-lag, pressure, radiation experiments in improved setup).
2. (2) The radiation correction for temperature in the Alpha1 version is still based on existing data from experiments in the old Lindenberg radiation chamber. LC is in the developing and testing phase of a completely new extended setup. There is not yet sufficient data available from the new setup to derive an improved radiation correction.

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

**Main Contact:** Masatomo Fujiwara

**Due Date:** (This task was given low priority at the ICM-10)

**Status:** Suspended (decided at the ICM-10)

**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:** Masatomo took over Kats work in June 2017, and was given a lecture on the basics of the BUFR code from Kensaku Shimizu in March 2018.