

Task Team on Radiosonde

- Progress Report for April 2016-June 2017 -

Masatomo Fujiwara (Hokkaido Univ., Japan), and
the Task Team Radiosonde members

The Team will

- **Provide guidelines** for the GRUAN on how to obtain the best possible, reference quality data from **radiosoundings**
- **Evaluate radiosonde data products** on the basis of the GRUAN specifications

Members

- Member changes, etc.
 - **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.
 - **Rolf Philipona** has stepped down as the co-chair and left the team as he retired from MeteoSuisse in May 2017.
- A new co-chair is needed!
- New members are welcome!

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	

Updates of the Tasks

Main Tasks

1. *Auto-launchers versus manual launches → Rigel Kivi's talk*
2. ***Multi-payload launch configurations***
3. ***Amendments to the Manual on Codes (WMO No. 306) for BUFR (transmitting uncertainties, etc.)***
4. *Time lag in Vaisala RS92 humidity corrections*

Tasks led by LC or other body

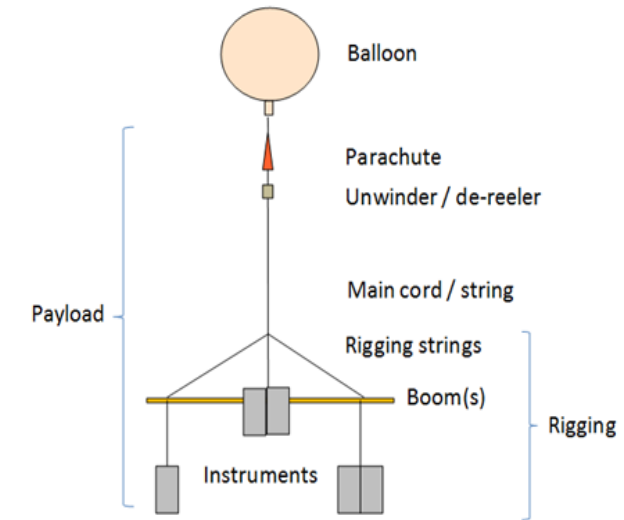
1. *GRUAN Radiosonde Omnibus/generic Technical Document*
2. *RS92 GRUAN Data Product version 3*
3. *GRUAN TD for non-RS92 sondes (Meteolabor, Modem, Meisei, etc.) → Masami Iwabuchi's talk for Meisei*

Other Tasks

1. *Define the non-RS92 data collection client requirement*
2. *Develop a UT/LS water vapour data product*
3. *GRUAN data product for RS92 (incl. TD for pre-launch procedure)*
4. *Ozonesondes data product*

Multi-payload Launch Configurations


- A manuscript has been submitted to the LC & WG chairs last week.
 - Title: “Review of Multiple-payload Radiosonde Sounding Configurations for Determining Best-Practice Guidance for GRUAN Sites”
 - Authors: Hannu Jauhiainen, M. Fujiwara, R. Philipona, R. Dirksen, D. F. Hurst, R. Kivi, H. Vömel, B. Demoz, N. Kizu, T. Oakley, K. Shimizu, M. Maturilli, T. Leblanc, F. Madonna, and R. Querel
 - A review of potential issues, a catalog showing various examples including RS41-RS92 flight configurations (31 photos/figures)
 - But, no quantitative studies, thus no clear recommendations
- Worth for an AMT paper with Supplement?
- The second phase would be to *encourage quantitative studies*
 - I.e., 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; JMA/Meisei’s various test flights)
 - But, might not be feasible for much heavier and complicated payloads?



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

- Strong leadership by Alexander (Sasha) Kats until mid May 2017
- Taken over by: Masatomo Fujiwara, Nobuhiko Kizu, Task Team Radiosonde, Task Team Sites, Lead Centre, WMO CBS.
- Progress:
 - Sasha made the official procedure to make the amendments to the BUFR.
 - As of 3 May 2017, the following 4 new information can be sent with the BUFR:
 - 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
- Next steps:
 - GRUAN community discuss and determine the information that need to be added to the BUFR
 - (In practice, we start with the metadata for the GRUAN Data Product)
 - Then, we 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.

DRAFT AMENDMENTS TO THE MANUAL ON CODES (WMO NO. 306) BY THE FAST-TRACK PROCEDURE

5. Radiosounding meta-data reporting: clarifications and amendments required 

Add entries:

in BUFR/CREX Table B,

FX Y	Element Name	BUFR Unit	BUFR Scale	BUFR reference value	BUFR width (bits)	CREX Unit	CREX Scale	CREX width (char.)
0 02 088	Volume of gas used in balloon	m ³	3	0	13	m ³	3	4
0 03 027	Type of flight rig	Code table	0	0	4	Code table	0	2
0 08 037	Baseline check significance	Code table	0	0	5	Code table	0	2
0 08 038	Instrument data significance	Code table	0	0	8	Code table	0	3

Add Code tables:

0 03 027

Type of flight rig

Code figures

0	Solo (single radiosonde)
1	Block
2	Bar
3	Cross
4	T-rig
5	Double T-rig
6	Complex
7-14	Reserved
15	Missing value

0 08 038

Instrument data significance

Code figure

0	Verified instrument reading
1	Reference instrument reading
2-254	Reserved
255	Missing value

0 08 037

Baseline check significance

Code figure

0	Manufacturer's baseline check unit
1	Weather screen
2	GRUAN standard humidity chamber
3-30	Reserved
31	Missing value

Auto-launchers vs. Manual Launches

- **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.*



At Sodankylä



Autolauncher system in France

Introduction: Task Team Radiosonde

- Provide **guidelines** for the GRUAN on how to obtain the best possible, reference quality data from **radiosoundings**
- **Evaluate radiosonde data products** on the basis of the GRUAN specifications
- Survey **radiosondes and sensors** (in particular considering their performance in **intercomparisons**)
- Review the **uncertainty analyses** and **correction algorithms**
- Recommend **radiosonde launch procedures** and **metadata** to be collected
- Draw conclusions on the **suitability** of radiosondes, specific sensors, procedures, and algorithms **for the network**
- Promote scientific efforts for assessing and improving radiosondes
- Recommend measures for ensuring long-term stability of radiosonde records.
- Provide input to the **GRUAN manual** by defining launch procedures and pre-launch checks that need to be followed by the sites