WMO/IOC/UNEP/ICSU
GLOBAL CLIMATE OBSERVING
SYSTEM (GCOS)

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**12th GRUAN Implementation-
Coordination Meeting (ICM-12)**
Virtual
16 - 20 November 2020

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Session 1

GRUAN Site Report for Sodankylä

(Submitted by Rigel Kivi)

Summary and Purpose of this Document

Report from the GRUAN site Sodankylä for the period January to December 2019.

Overview

At Sodankylä both manual and automatic radiosonde launch systems have been operational. Data from manual and automated soundings have been submitted to the GRUAN database. The manual sounding dataflow includes Vaisala RS92-SGP, ECC ozonesonde, CFH water vapor, Intermet iMet-1, Vaisala RS41. The data have been uploaded using the RsLaunchClient software. In addition the GNSS dataflow has been set up and the GNSS Site SODF is operational.

Change and change management

Change from RS92 to RS41 took place on March 30, 2017. Since then we have launched RS41 sondes on regular basis, while the ozonesondes were flown using RS92 during 2019. The CFH launches involved iMet sondes. RS92 and RS41 comparison flights have been performed at Sodankylä. The comparison flights have included CFH as a reference instrument. There have been also parallel flights using manual and autosonde system.

Resourcing

Currently our budget funding is not covering all the research activities. We have involved external funding for the research flights.

Operations

Sondes in wintertime have been launched using larger balloons. Therefore, balloon burst point has been relatively high regarding the wintertime soundings.

Site assessment and certification

Our site has been certified.

GRUAN-related research

GRUAN research is related to the work within the Radiosonde task team.

WG-GRUAN interface

Letter of support from the Working Group on GRUAN is found to be useful.

Other archiving centers

Data have been submitted to NDACC, WOUDC, TCCON, NILU and project databases.

Participation in campaigns

We have performed rig soundings including CFH, RS41, RS92. In 2019 we have hosted ESA funded campaign FRM4GHG, which has included AirCore, FTS and in situ tower measurements in Sodankylä. We also participated in EU RINGO campaign in Tranou, France in June 2019. Drone-based AirCore and SIF flights were performed in summer/autumn 2019.

Future plans

Site continues research activities within GRUAN. At Sodankylä multiple sonde payloads can be flown. There is a possibility to host research campaigns at the FMI Sodankylä site.

GRUAN Site Report for Sodankyla (SOD), 2019

Reported time range is Jan 2019 to Dec 2019
Created by the Lead Centre
Version from 2020-11-05

1 General GRUAN site information

Object	Value
Station name	Sodankyla
Unique GRUAN ID	SOD
Geographical position	67.3700 °N, 26.6300 °E, 179.0 m
Operated by	FMI	Ilmatieteen laitos
Main contact	Kivi, Rigel
WMO no./name	02836 SODANKYLÄ
Operators	currently 8, changes +0 / -0
Sounding Site	2
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
SOD-GN-01	GNSS Site SODF	GNSS	1	operational
SOD-RS-01	Sodankylä Radiosonde Launch Site	Sounding Site	4	34
SOD-RS-02	Automatic Sodankylä Launch System (AUTOSONDE)	Sounding Site	2	733

1.2 General comments from Lead Centre

No comments from Lead Centre.

2 System: GNSS Site SODF (SOD-GN-01)

Object	Value
System name	GNSS Site SODF
Unique GRUAN ID	SOD-GN-01
System type	GNSS (GN - GNSS)
Geographical position	67.4209 °N, 26.3890 °E, 299.7 m
Operated by	FMI	Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	-
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC and the GRUAN GNSS processing centre at GFZ has started in February 2015. The current dataflow includes manufacturer raw data, converted raw data (RINEX) and instrument logs, containing all equipment changes.

Meteorological data is missing, therefore the operational processing as GNSS-PW-GDP cannot be performed at moment.

3 System: Sodankylä Radiosonde Launch Site (SOD-RS-01)

Object	Value
System name	Sodankylä Radiosonde Launch Site
Unique GRUAN ID	SOD-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	67.3700 °N, 26.6300 °E, 179.0 m
Operated by	FMI | Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	-
Defined setups	4 (RESEARCH, OZONE, ROUTINE2, OZONE2)
Possible streams	CFH, COBALD, RS41, RS80, RS92

3.1 Lead Centre comments

3.1.1 Dataflow
Dataflow to GRUAN LC is operational since October 2010. Dataflow includes: Vaisala RS41-SG, Vaisala RS92-SGP, ECC ozone sonde, CFH water vapour, Intermet IMET-1, and Vaisala RS80. The launches are transmitted using RsLaunchClient.

3.1.2 General
This is the manual launch site, used for ECC ozone sondes, CFH sondes and other manually released research sondes.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

3.2.1 Stream: CFH

Product	Version	Soundings received	Available at LC	Distributed by NCEI
CFH		1	1	

3.2.2 Stream: ECC

Product	Version	Soundings received	Available at LC	Distributed by NCEI
ECC		29	29	

3.2.3 Stream: IMET-1

Product	Version	Soundings received	Available at LC	Distributed by NCEI
IMET-1		1	1	
IMET-1-RAW	001		1	

3.2.4 Stream: RS92

| Product	Version	Soundings received	Available at LC	Distributed by NCEI
RS92		33	33	
RS92-GCA	001		31	
RS92-RAW	001		33	
RS92-RAW	002		33	
RS92-EDT	001		33	
RS92-GDP	002		32	

3.3 Availability of data products

Available (green): All steps of data processing have been successfully completed. The data product file is available at LC (e.g. files that didn't pass QA/QC or uncertified GRUAN data products) and/or at NCEI (a certified GRUAN data product file that did pass QA/QC).

Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software error.

Original (red): The original, manufacturer-produced, raw data file is available (e.g. MWX data file) but was not converted into a GRUAN-standardized raw data format (NetCDF). Reasons for this may be missing data conversion software, a software error, or a corrupt data file.
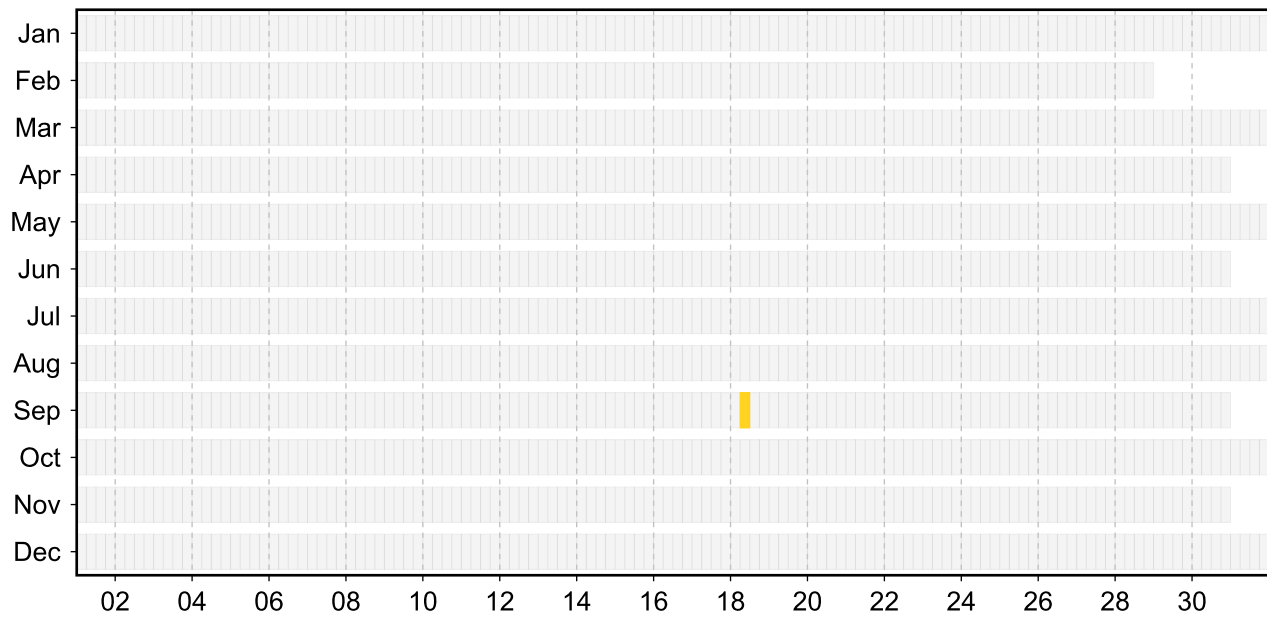
3.3.1 Stream: CFH

Data availability CFH

3.3.2 Stream: ECC
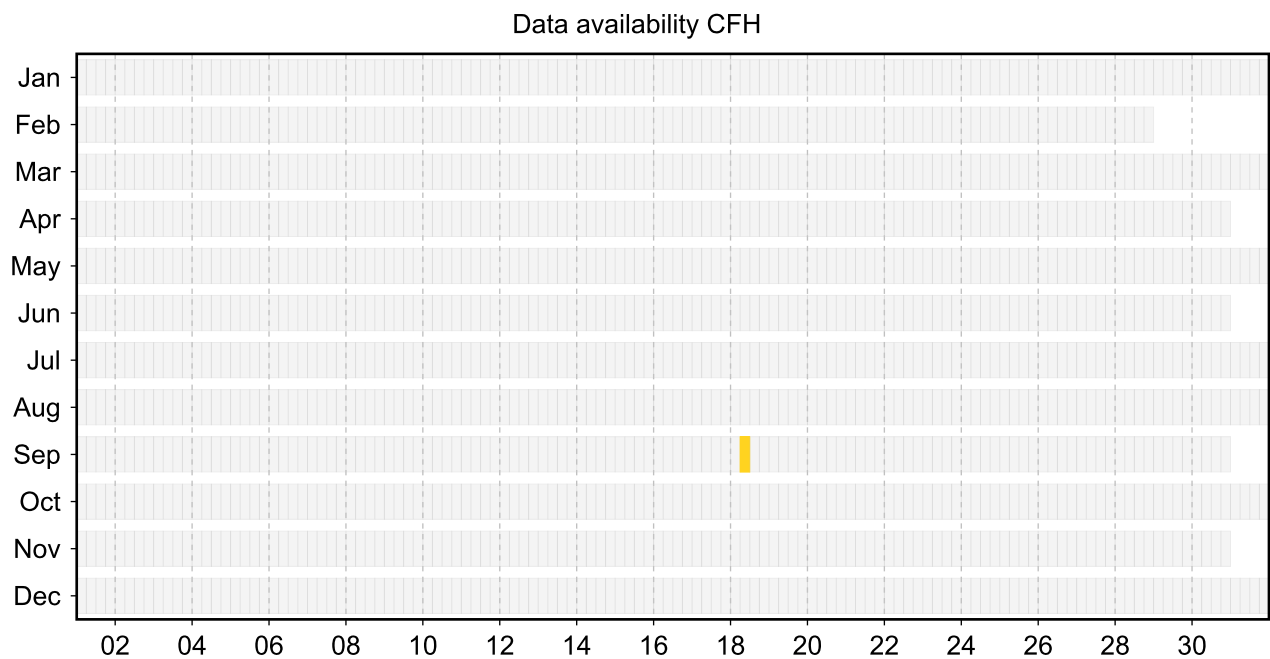
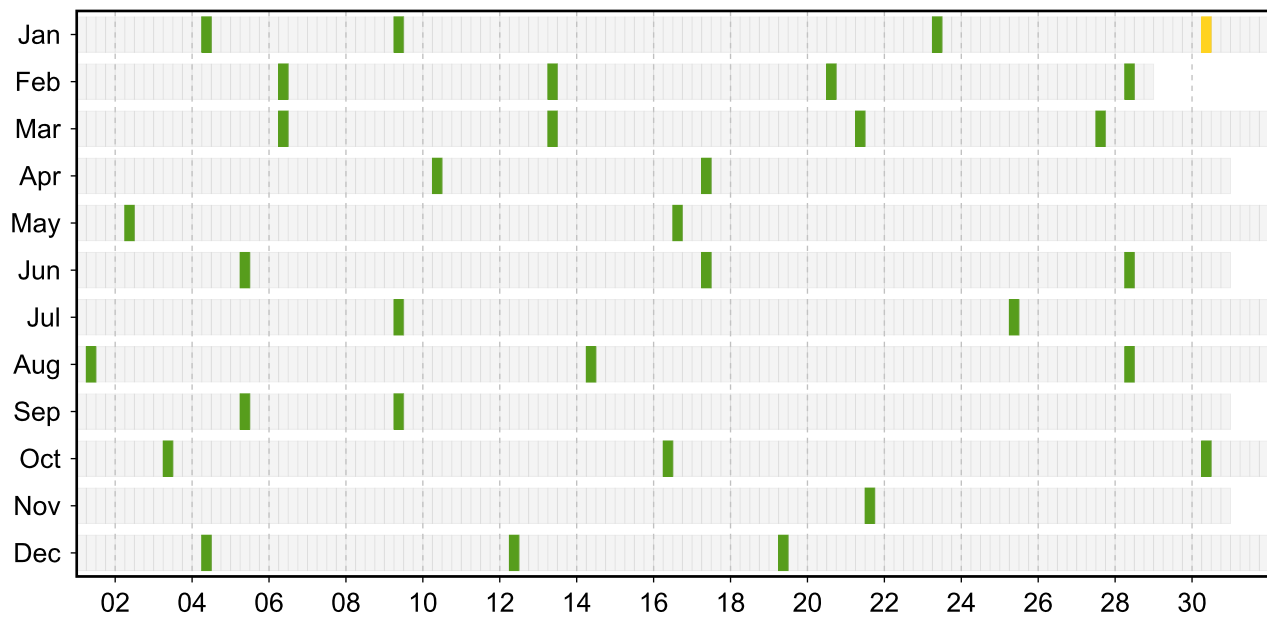Data availability ECC
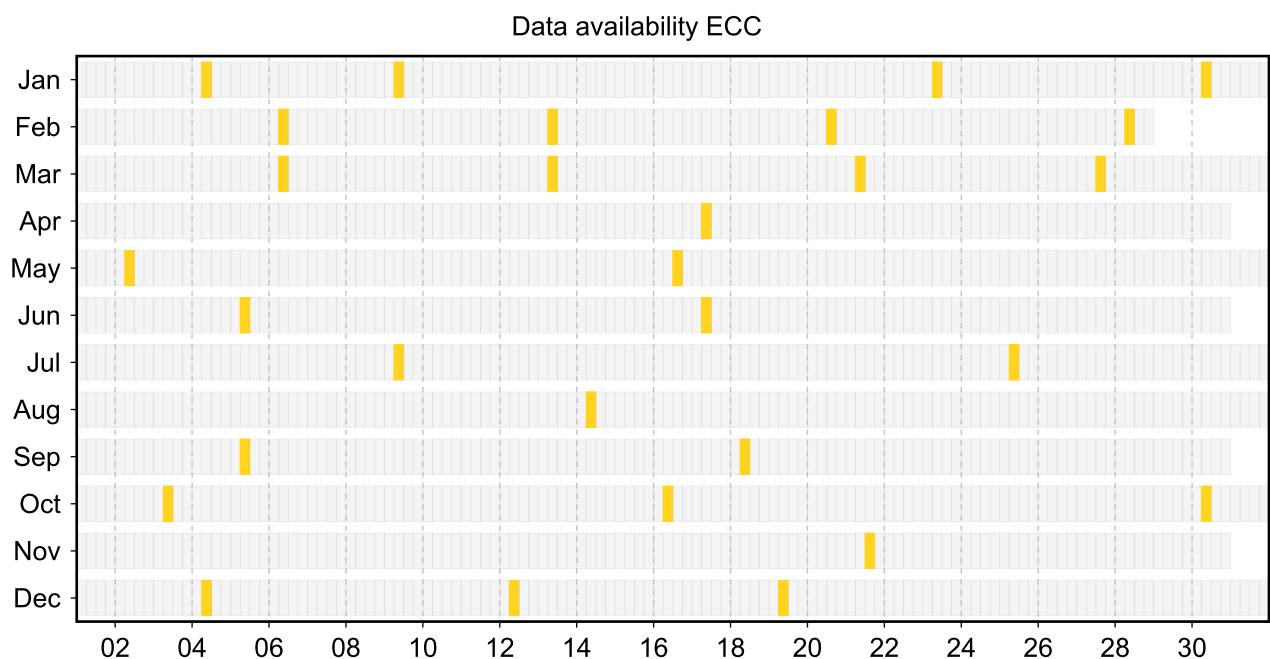
3.3.3 Stream: IMET-1

Data availability IMET-1

3.3.4 Stream: RS92

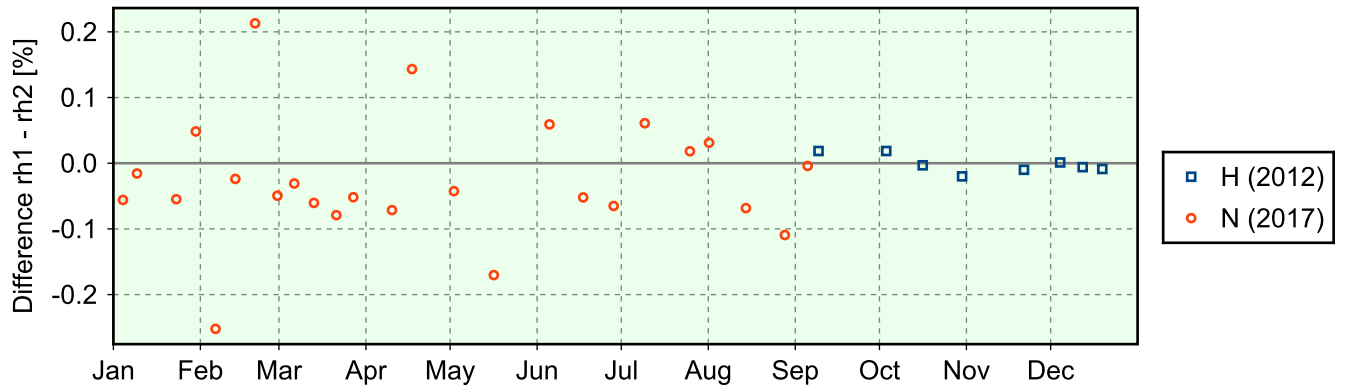Data availability RS92

3.4 Instrument combinations of SOD-RS-01

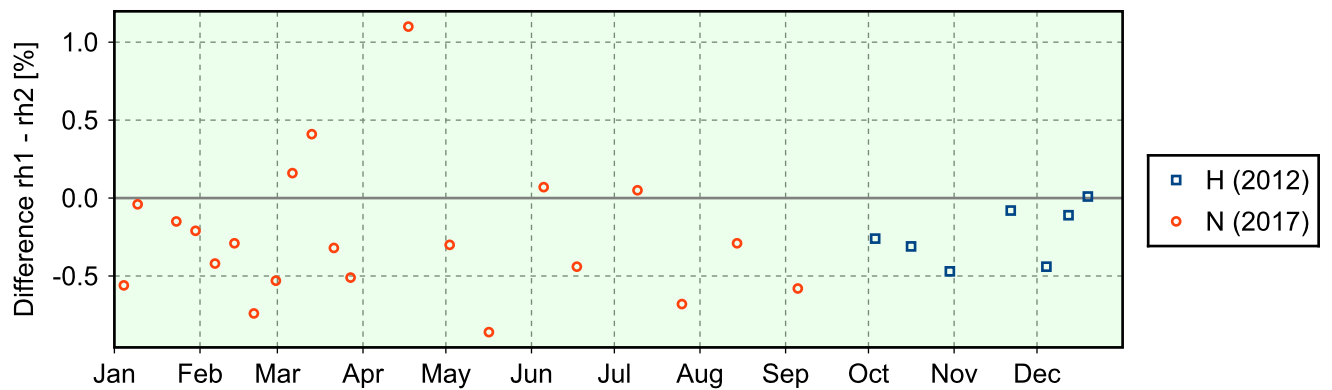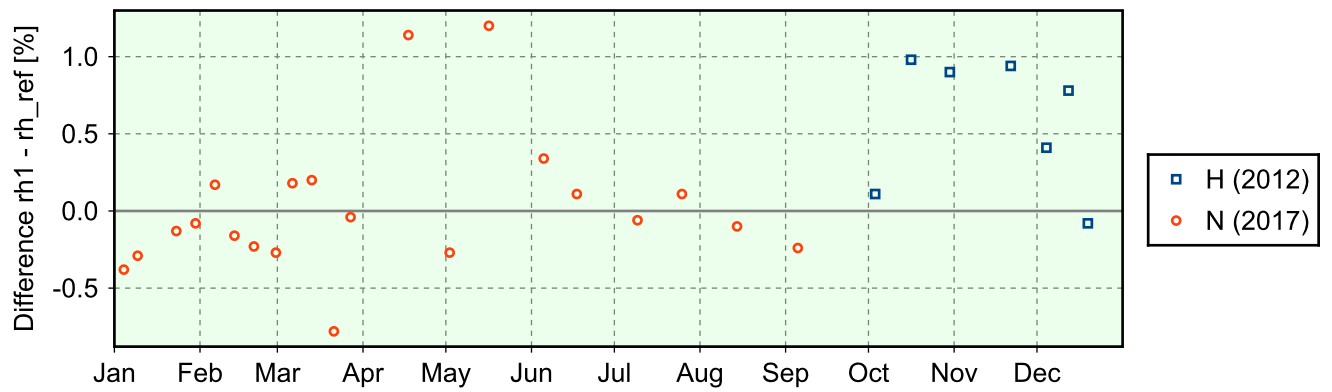| Count	Instrument combination
1	CFH, ECC, IMET-1
28	ECC, RS92
5	RS92

3.5 Instrument ground check
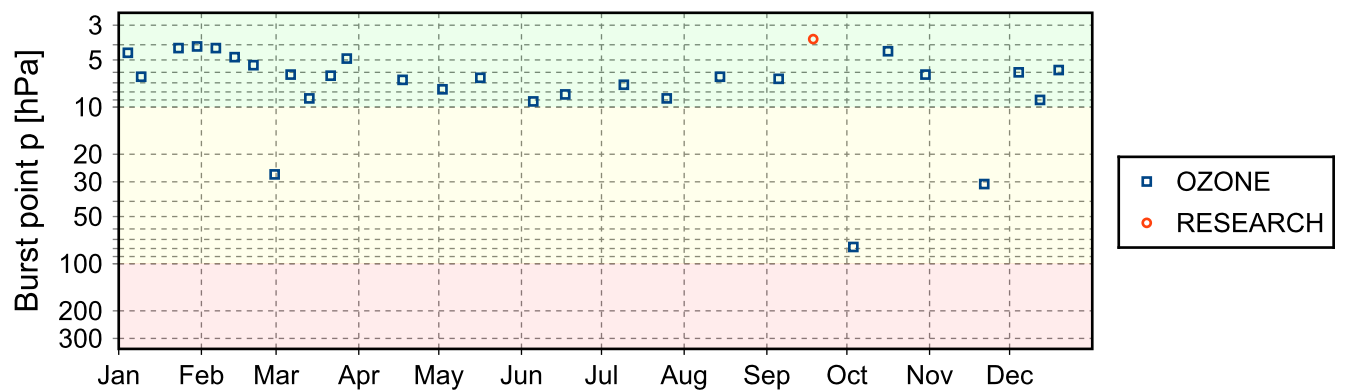
3.5.1 Stream: RS92

(1) GroundCheck: GC-GC25
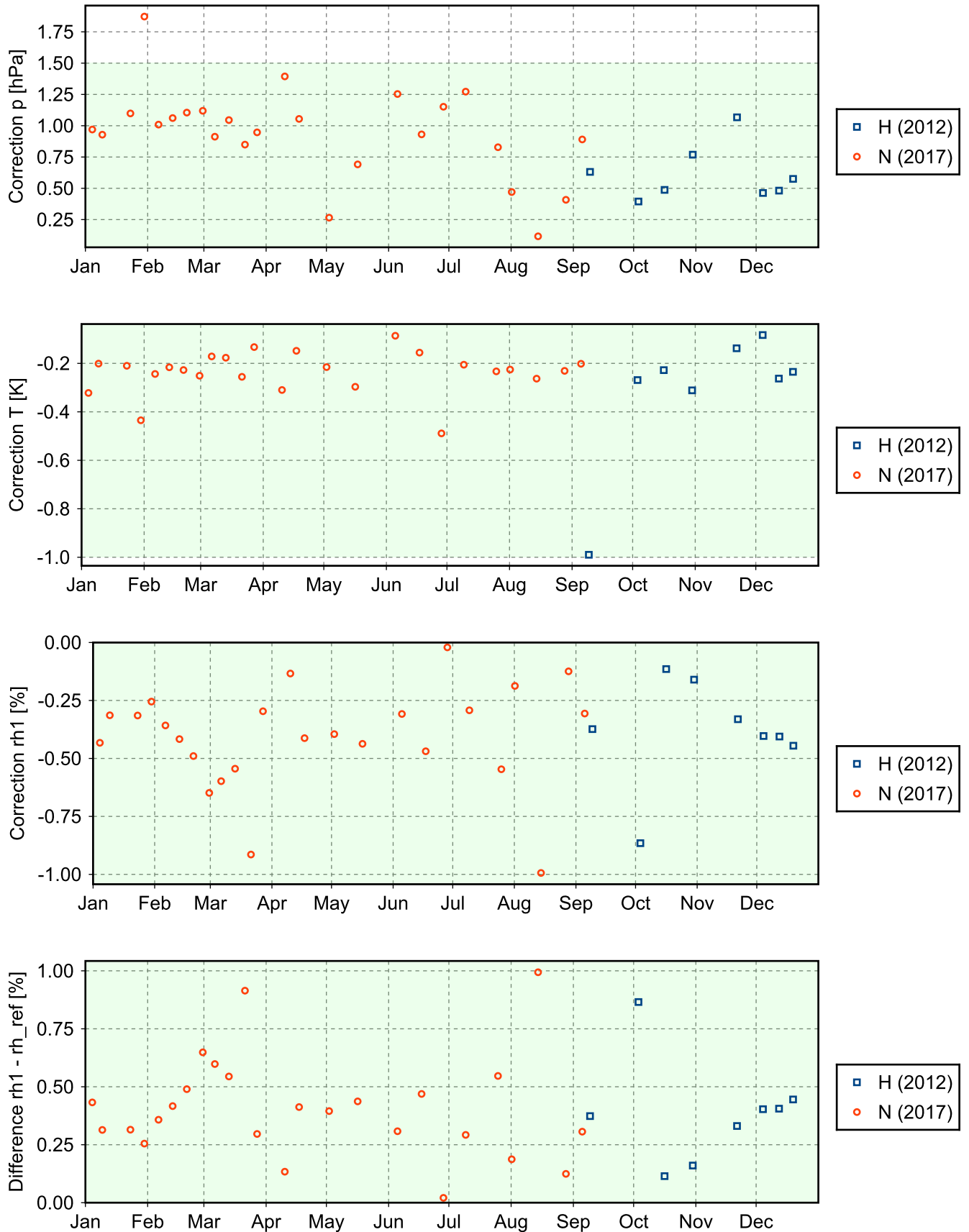
(2) GroundCheck: GC-SHC

3.6 Measurement events

4 System: Automatic Sodankylä Launch System (AUTOSONDE) (SOD-RS-02)

Object	Value
System name	Automatic Sodankylä Launch System (AUTOSONDE)
Unique GRUAN ID	SOD-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	67.3663 °N, 26.6313 °E, 179.0 m
Operated by	FMI | Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	2008-01-01
Defined setups	2 (ROUTINE, ROUTINE3)
Possible streams	RS41, RS92

4.1 Lead Centre comments

4.1.1 Dataflow
Dataflow to GRUAN LC is operational since January 2011. Currently a weekly delivery to GRUAN LC is implemented.

4.1.2 General
This is the auto-launcher data stream.

Routine soundings using Vaisala RS41-SG are performed two times per day.

4.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

4.2.1 Stream: RS41

| Product	Version	Soundings received	Available at LC	Distributed by NCEI
RS41		733	733	
RS41-RAW	001		732	
RS41-EDT	001		727	
RS41-GDP-ALPHA	001		114	
RS41-GDP-ALPHA	002		595	
RS41-GDP-ALPHA	003		240	
RS41-GDP-BETA	001		241	

4.3 Availability of data products

Available (green): All steps of data processing have been successfully completed. The data product file is available at LC (e.g. files that didn't pass QA/QC or uncertified GRUAN data products) and/or at NCEI (a certified GRUAN data product file that did pass QA/QC).

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4.3.1 Stream: RS41

Data availability RS41
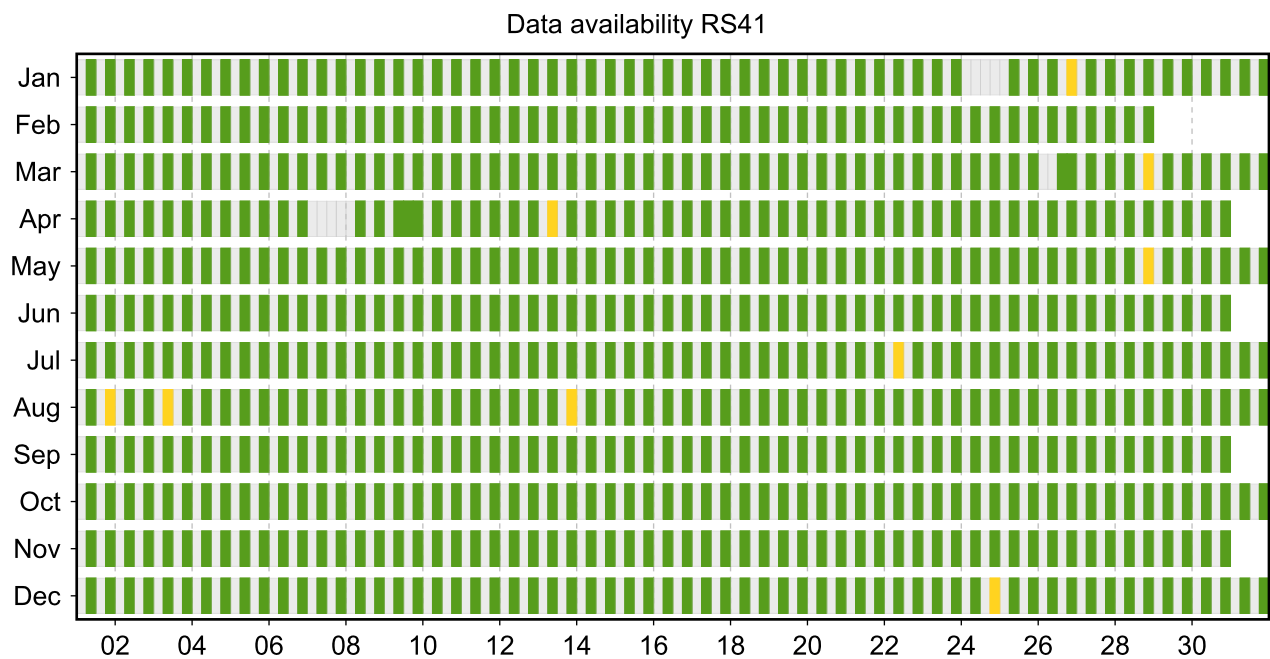
4.4 Instrument combinations of SOD-RS-02

Count	Instrument combination
733	RS41

4.6 Measurement events