



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

Doc. 7.21
(13.IV.2018)

**10th GRUAN Implementation-
Coordination Meeting (ICM-10)**

Session 7

Potsdam, Germany

23 - 27 April 2018

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 2017.



GRUAN Site Report for Sodankylä (SOD)

Reporting for the period January to December 2017

Date: 5-April-2018

Primary author: Rigel Kivi

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Overview

Our measurements have been submitted to the GRUAN data streams. At Sodankylä we have currently receiving systems for both manual and automated soundings. Altogether 32 manual soundings and 717 automated soundings have been submitted during the reporting period, using the GRUAN operating procedures. The manual sounding dataflow includes Vaisala RS92-SGP, ECC ozone sonde, CFH water vapor, Internet IMET-1, Vaisala RS80, RS41. The data have been transmitted using the RsLaunchClient software. In addition the GNSS dataflow has been set up and the GNSS Site SODF is operational.

Change and change management

RS92 and RS41 comparison flights have been made at Sodankylä. RS41 showed improvements for humidity and temperature measurements compared to the RS92, especially in the upper troposphere. The comparison flights have included CFH as a reference instrument. Change from RS92 to RS41 was made on March 30, 2017. Since then we have launched RS41 sondes on regular basis. The ozonesondes are flown using RS92. RS41 will be used within the CFH soundings.

Resourcing

Currently our budget funding does not cover all the research activities, therefore external funding is needed to continue with these activities.

Operations

A challenge is to increase the number of TA600 or TA800 balloons also during the summer period. However, currently the main issue is the rising cost which is expected as a consequence of this change if approved by the institute.

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 would be useful from the Working Group on GRUAN. Probably also other ways might be possible to increase GRUAN visibility within the institute. ICM-9 was hosted by the FMI. FMI scientist had several presentations at ICM-9. Also a session related to GAIA-CLIM took place at the FMI.

Items for ICM-10 plenary discussions

Change management issues, for example in case of RS92/RS41. Also external funding possibilities would be of interest to discuss with the GRUAN partners.

Other archiving centers

We are submitting data to NDACC, WOUDC, TCCON, NILU database.

Participation in campaigns

Campaigns of rig soundings of CFH, RS41, RS92. In 2017 we hosted ESA campaign related to TROPOMI (FRM4GHG). Additional radiosondes were launched during YOPP in February-March 2018.

Upcoming campaigns in 2018 include continuation of FRM4GHG, DLR CoMet campaign, EU RINGO campaign.

Future plans

Over the coming year we expect to improve instrumentation at the site and participate in the GRUAN task team activities. We also hope to contribute to the instrument development regarding additional sensors to be flown in the GRUAN payload. Some research activities will include UAV based measurements.



GRUAN Site Report for Sodankyla (SOD), 2017

Reported time range is Jan 2017 to Dec 2017

Created by the Lead Centre

Version from 2018-04-06

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	3	32
SOD-RS-02	Automatic Sodankylä Launch System (AUTOSONDE)	Sounding Site	2	717

1.2 General comments from Lead Centre

1.2.1 General

Two sounding sites have been defined, one for manual launches, one for the auto-launcher, even though both sites are in close proximity.

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.

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	3 (OZONE, RESEARCH, ROUTINE2)
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, Internet 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
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3.2.1 Stream: CFH

CFH		1	1	
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3.2.2 Stream: ECC

ECC		32	32	
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3.2.3 Stream: IMET-1

IMET-1		1	1	
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3.2.4 Stream: RS41

RS41		1	1	
RS41-RAW	001		1	
RS41-EDT	001		1	

3.2.5 Stream: RS92

RS92		32	32	
RS92-RAW	001		32	
RS92-RAW	002		32	
RS92-EDT	001		32	
RS92-GDP	002		26	21

3.3 Data availability of data products

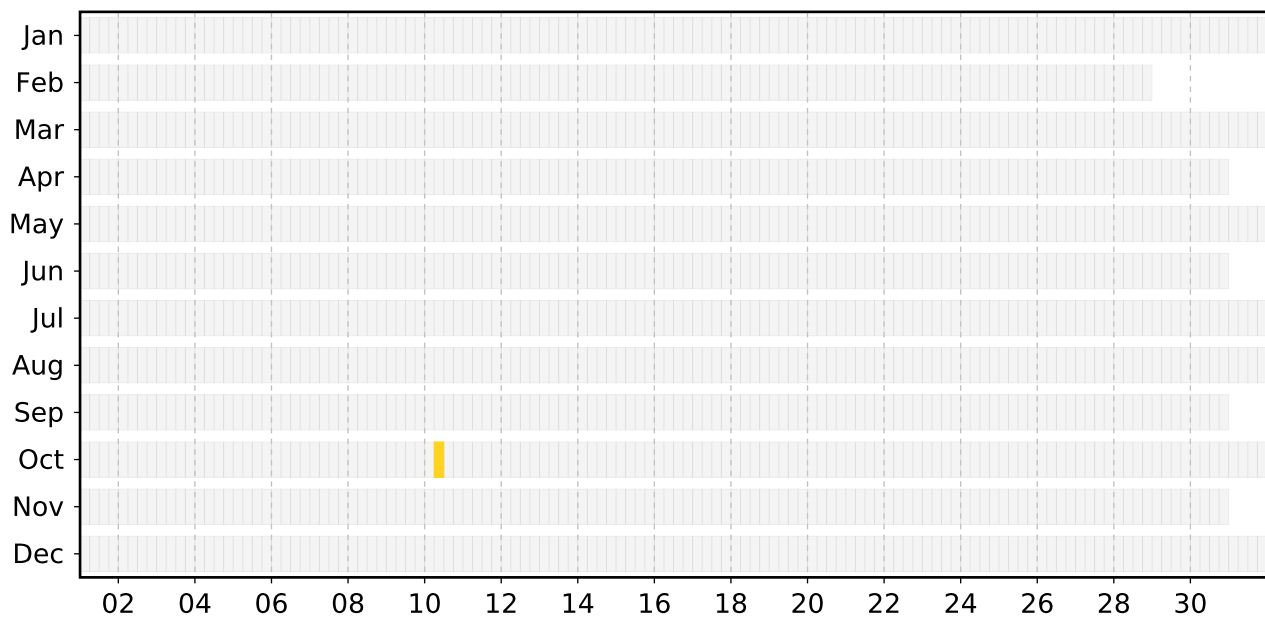
Available (green): All steps of processing have been successfully completed. The data file is available at LC (e.g. unapproved or uncertified GRUAN data products) and at NCEI (approved and certified GRUAN data products).

Unprocessed (yellow): The raw data file has been successfully converted to a GRUAN standardized raw data file format (NetCDF). The processing (e.g. GRUAN data processing) has not yet been done, or has not been completed. Reason may be a processing routine which does not yet exist, or software errors.

Original (red): The original raw data file is available (e.g. MWX). The raw data file was not converted to a GRUAN standardized raw data file format (NetCDF). Reason may be a converting routine which does not yet exist, or a corrupt original raw data file, or software errors.

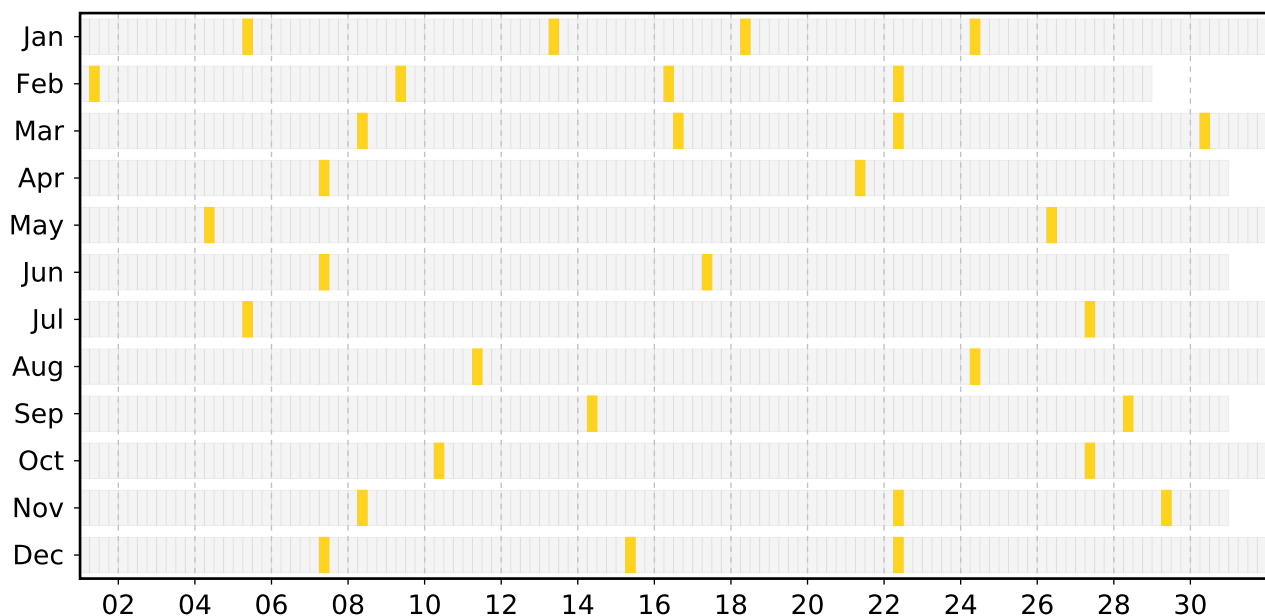
3.3.1 Stream: CFH

Data availability CFH



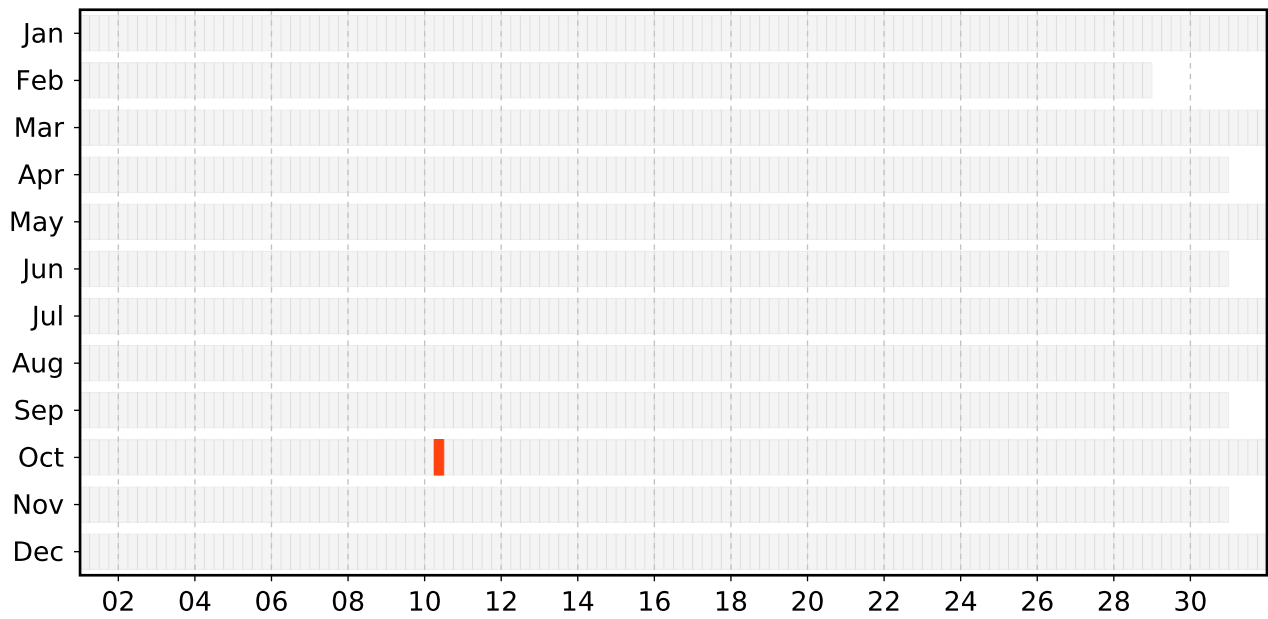
3.3.2 Stream: ECC

Data availability ECC



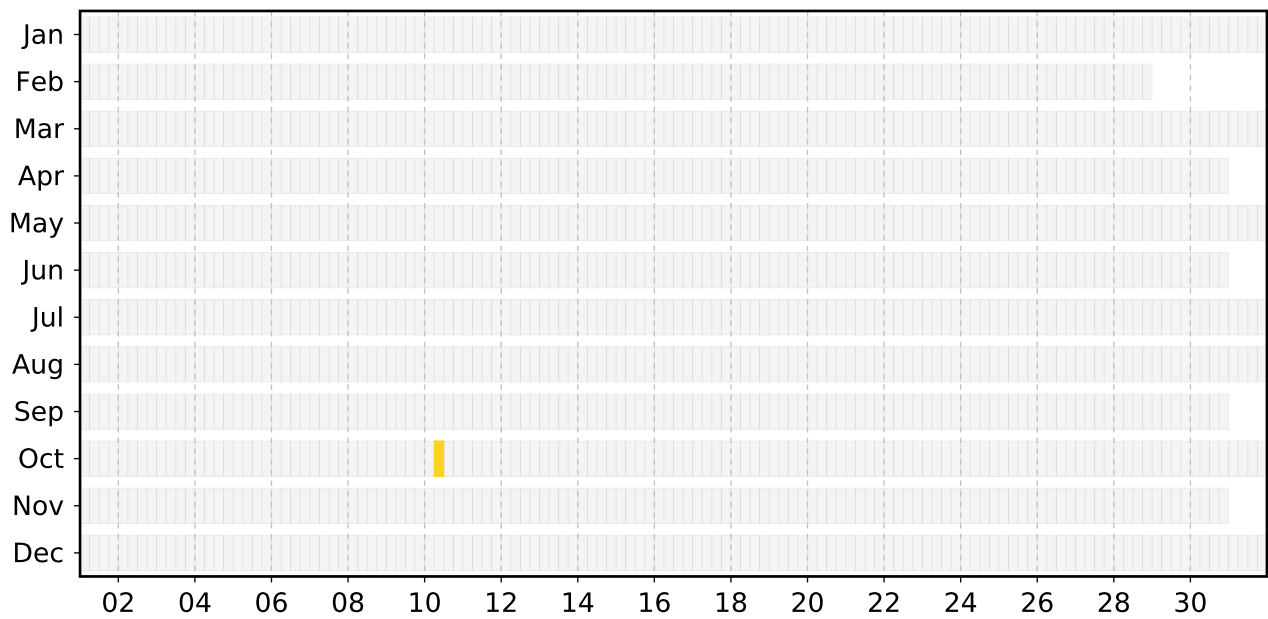
3.3.3 Stream: IMET-1

Data availability IMET-1

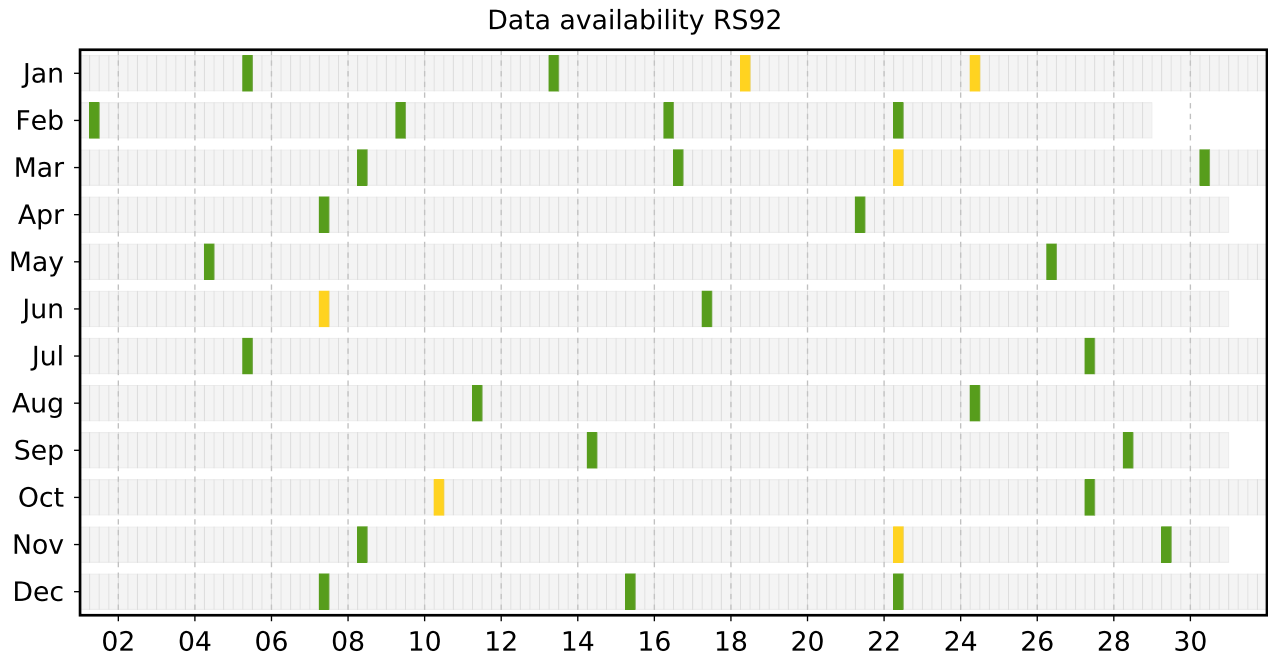


3.3.4 Stream: RS41

Data availability RS41



3.3.5 Stream: RS92



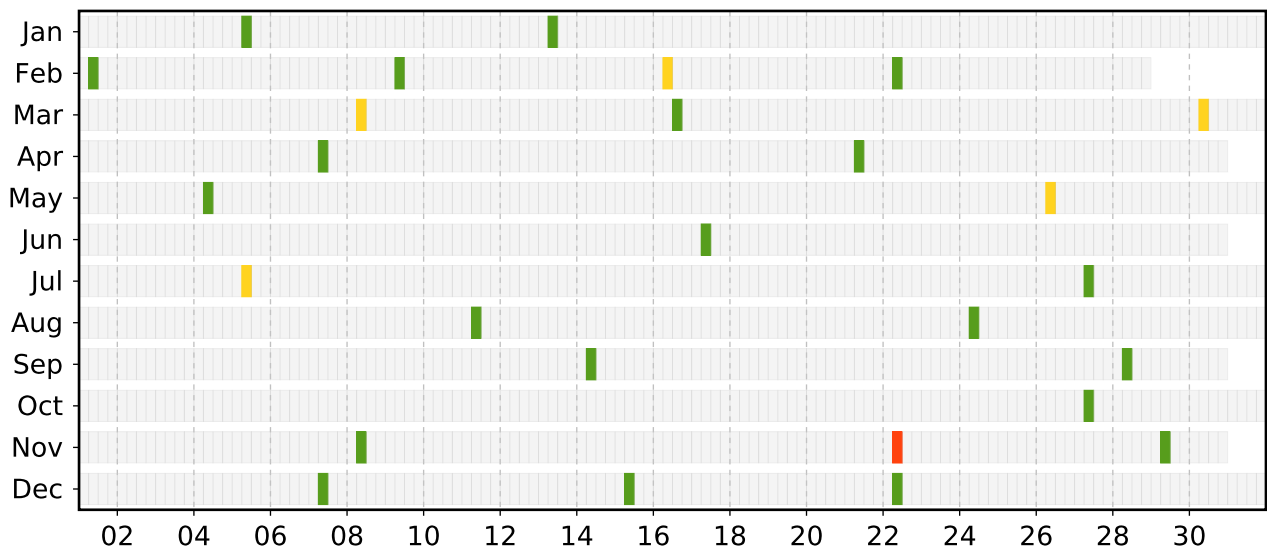
3.4 Data quality of current GRUAN data products

Month	Total	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

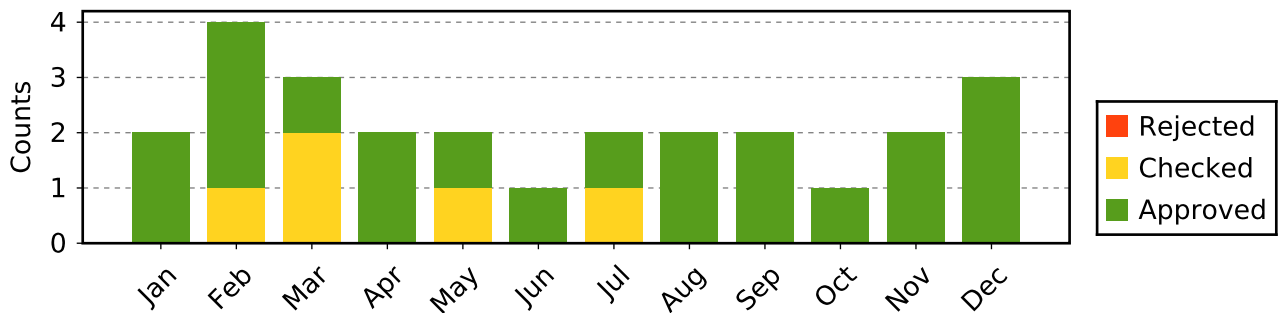
3.4.1 Stream: RS92 (Product: RS92-GDP-002)

Jan	2	2								
Feb	4	3	1					1		3
Mar	3	1	2					2		1
Apr	2	2								
May	2	1	1					1		
Jun	1	1								1
Jul	2	1	1					1		1
Aug	2	2								
Sep	2	2								
Oct	1	1								1
Nov	2	2								2
Dec	3	3								2
Sum	26	21	5					5		11

Data quality of stream RS92



Data quality statistic of stream RS92



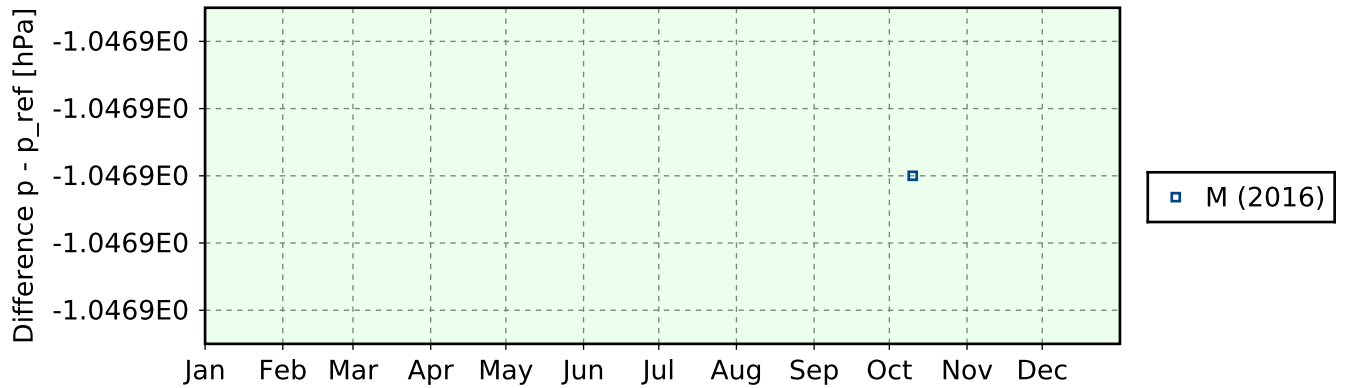
3.5 Instrument combinations of SOD-RS-01

Count	Instrument combination
1	CFH, ECC, IMET-1, RS41, RS92
31	ECC, RS92

3.6 Instrument ground check

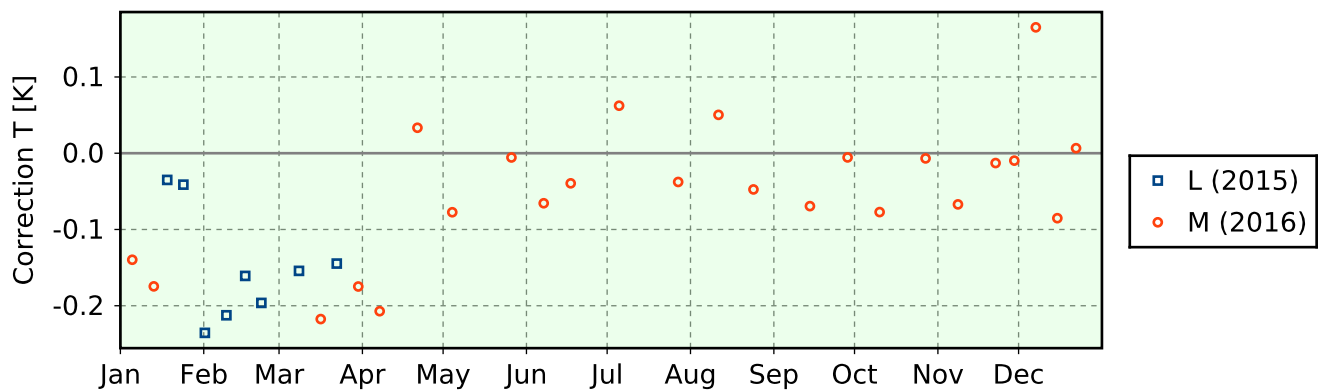
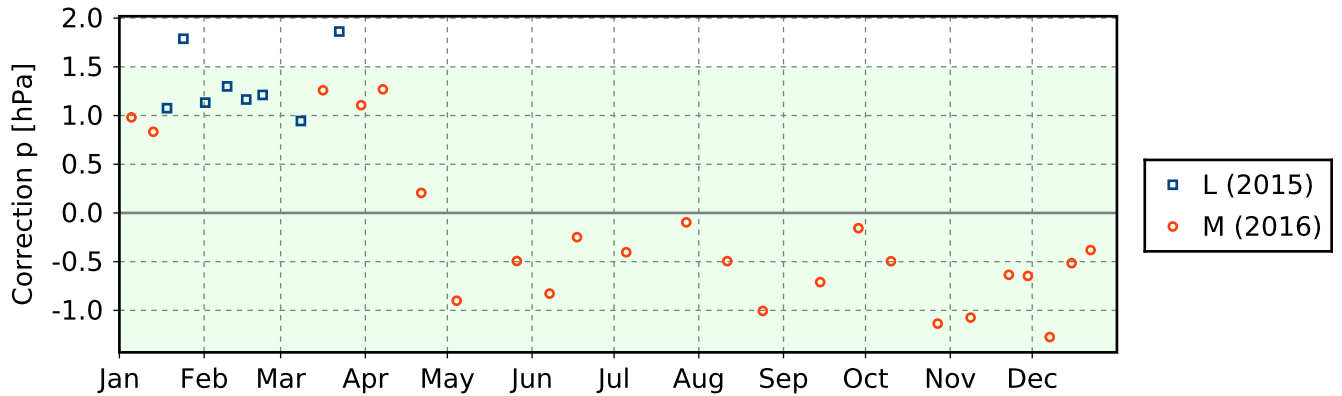
3.6.1 Stream: RS41

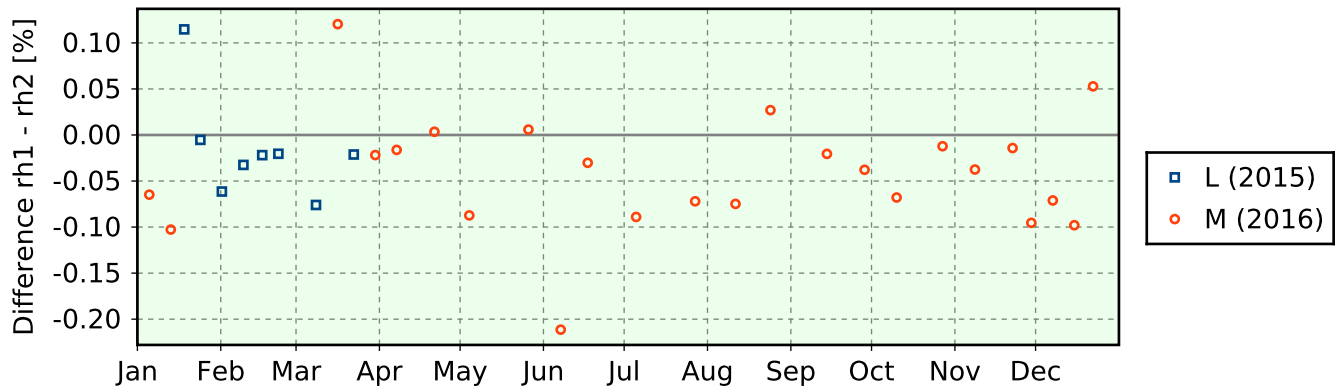
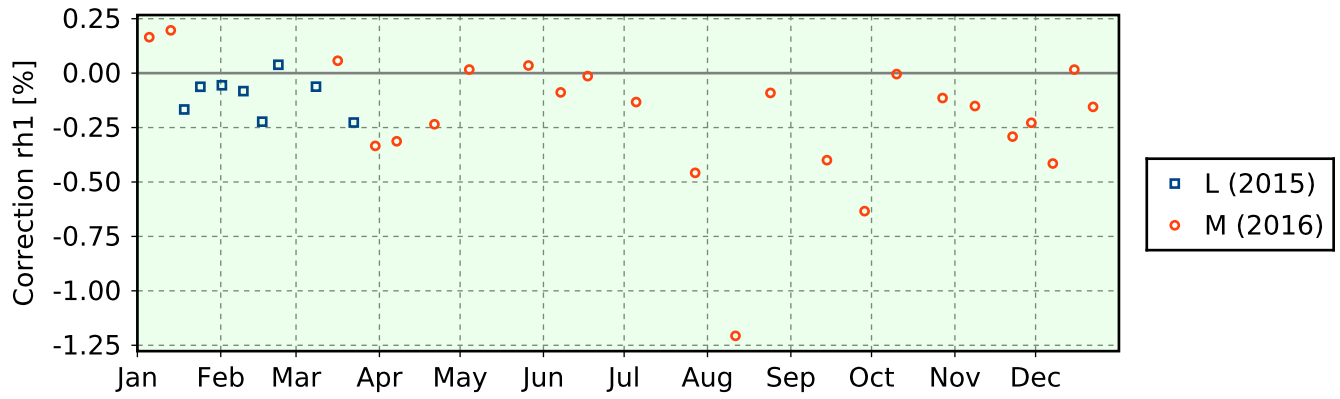
(1) GroundCheck: GC-RI41



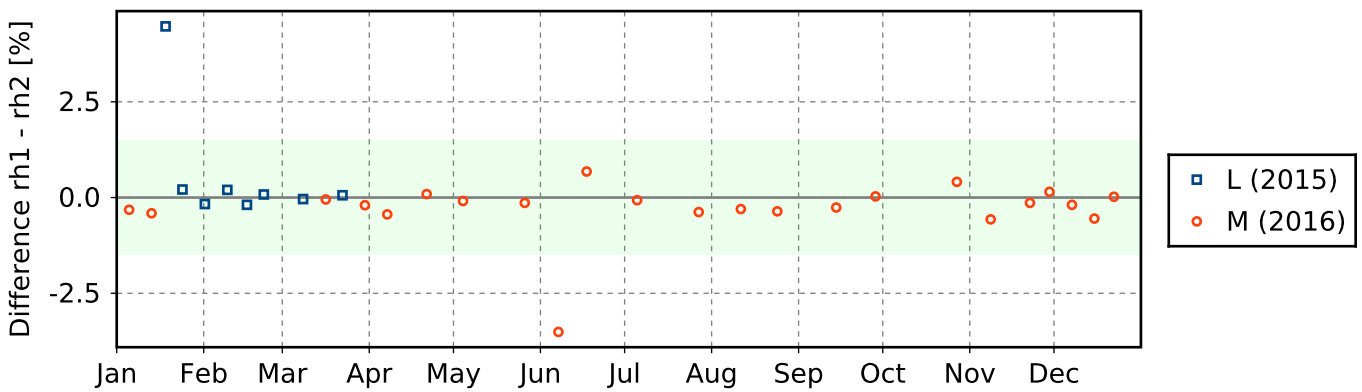
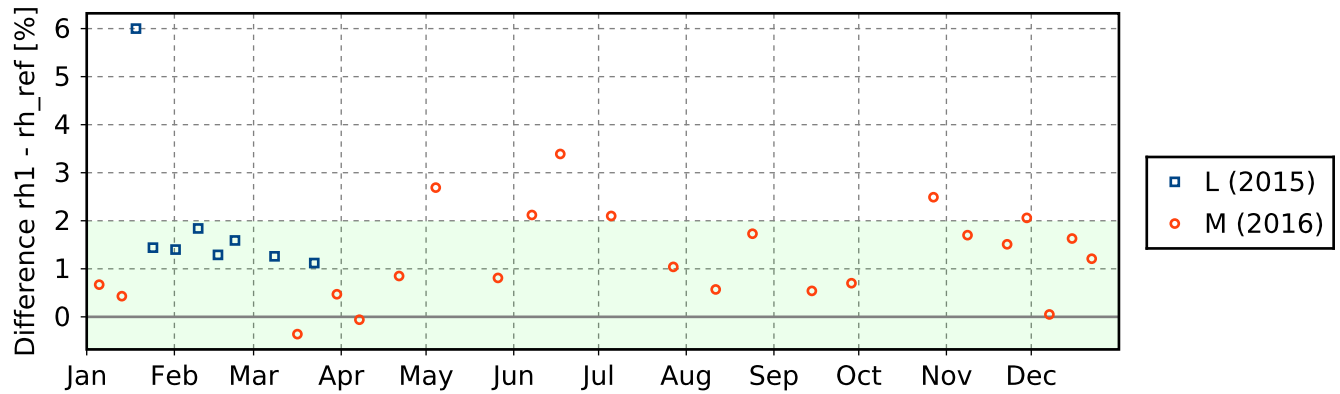
3.6.2 Stream: RS92

(1) GroundCheck: GC-GC25

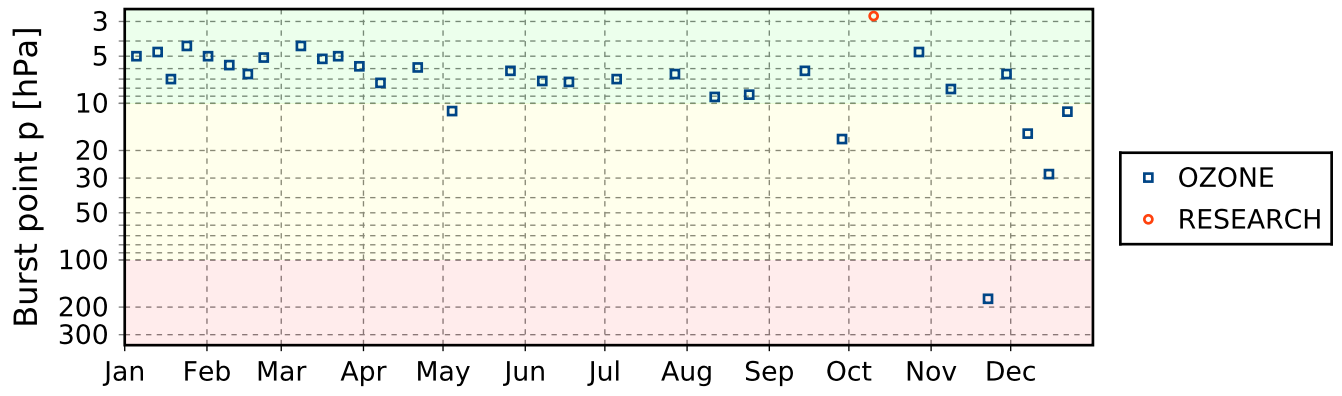




(2) GroundCheck: GC-SHC



3.7 Measurement events



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

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 are performed two times per day.

Change of operational sonde from Vaisala RS92-SGP to RS41-SG was on 24 March 2017.

4.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
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4.2.1 Stream: RS41

RS41		553	553	
RS41-RAW	001		553	
RS41-EDT	001		553	

4.2.2 Stream: RS92

RS92		164	164	
RS92-RAW	001		164	
RS92-RAW	002		164	
RS92-EDT	001		164	
RS92-GDP	002		108	54

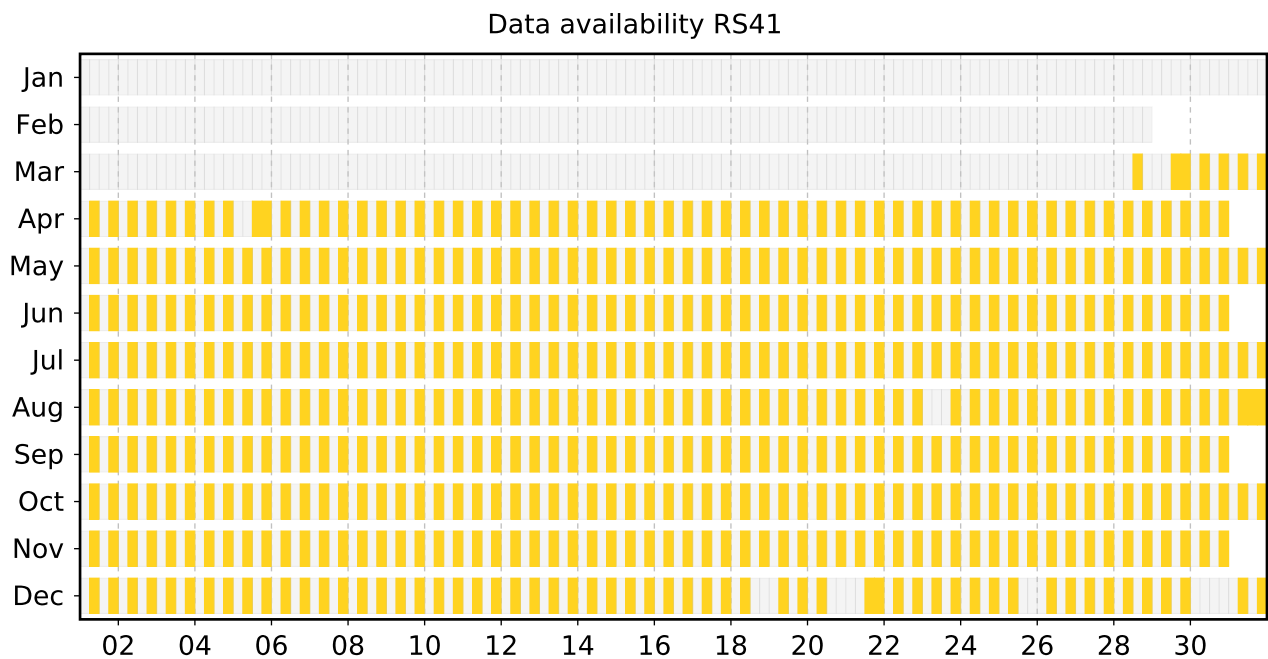
4.3 Data availability of data products

Available (green): All steps of processing have been successfully completed. The data file is available at LC (e.g. unapproved or uncertified GRUAN data products) and at NCEI (approved and certified GRUAN data products).

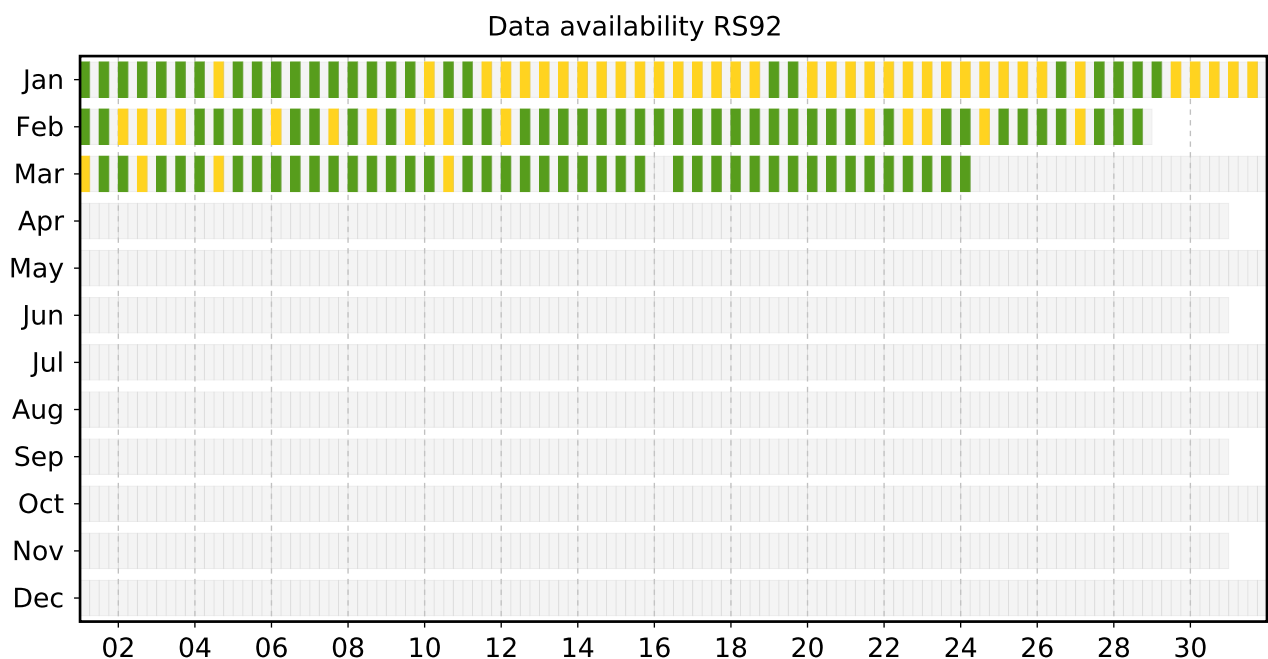
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4.3.1 Stream: RS41



4.3.2 Stream: RS92



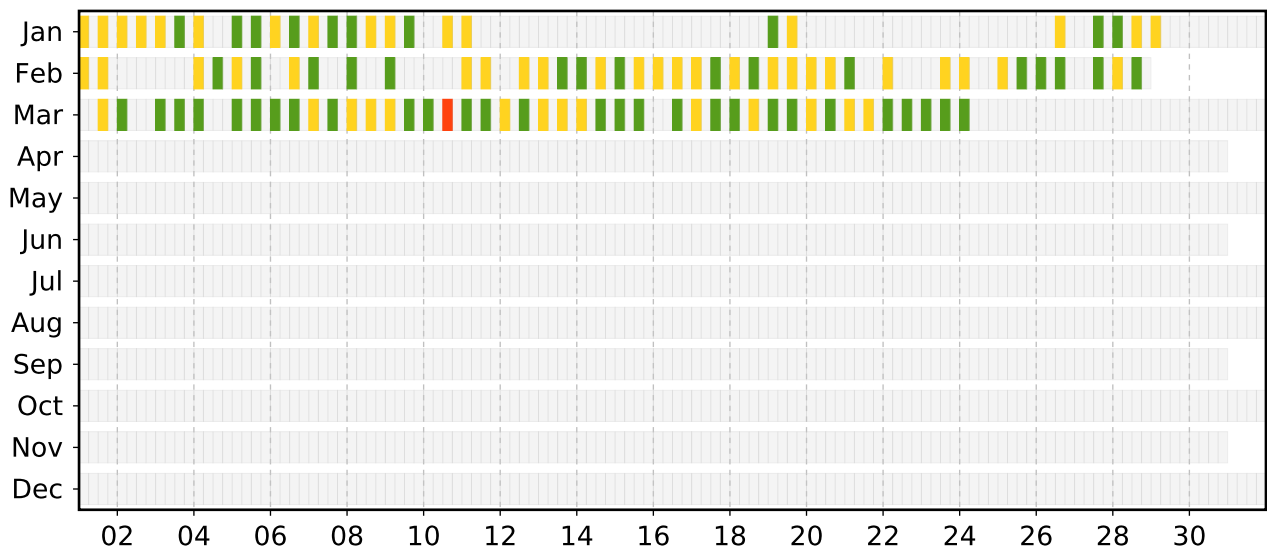
4.4 Data quality of current GRUAN data products

Month	Total	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

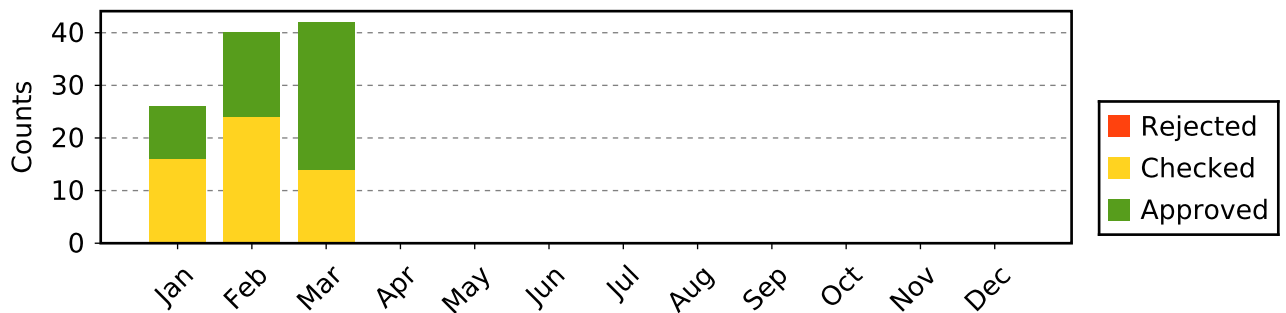
4.4.1 Stream: RS92 (Product: RS92-GDP-002)

Jan	26	10	16				3		15
Feb	40	16	24				9		21
Mar	42	28	14				2	1	12
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Sum	108	54	54				14	1	48

Data quality of stream RS92



Data quality statistic of stream RS92



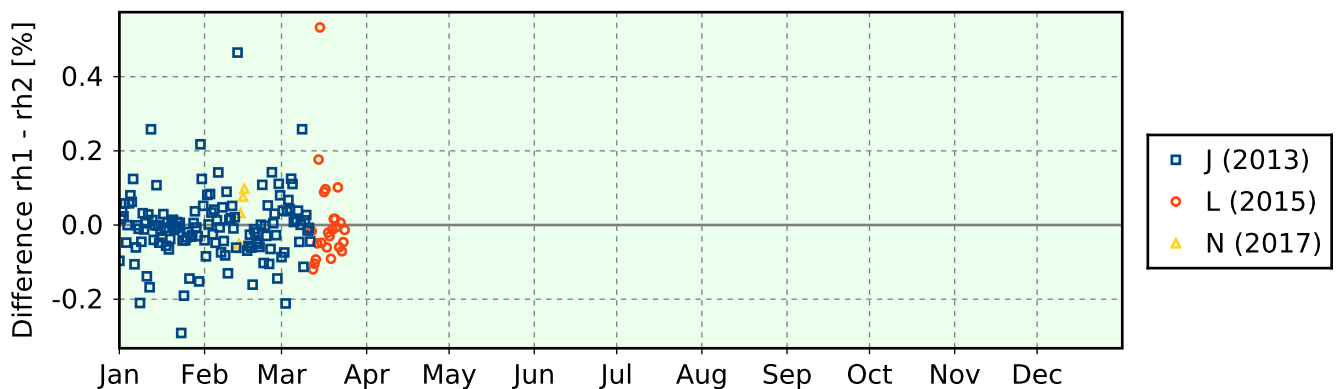
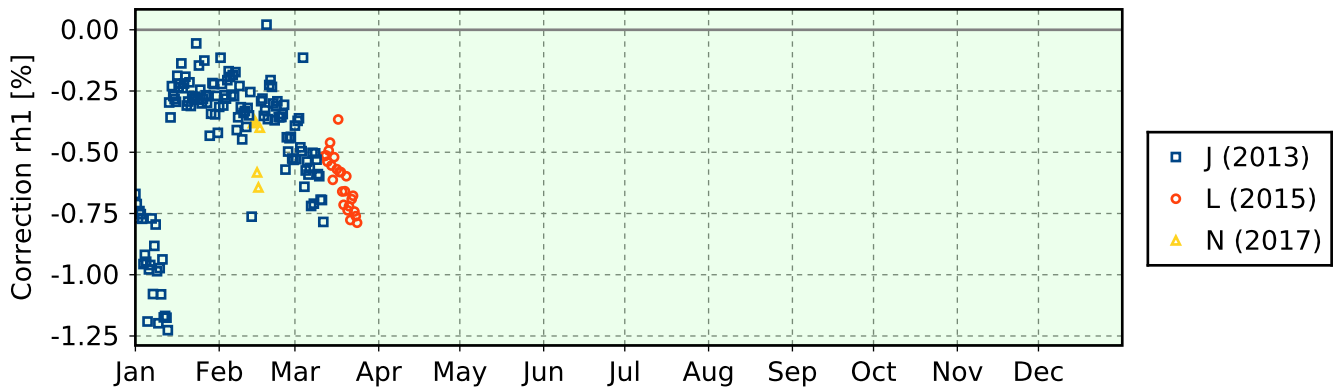
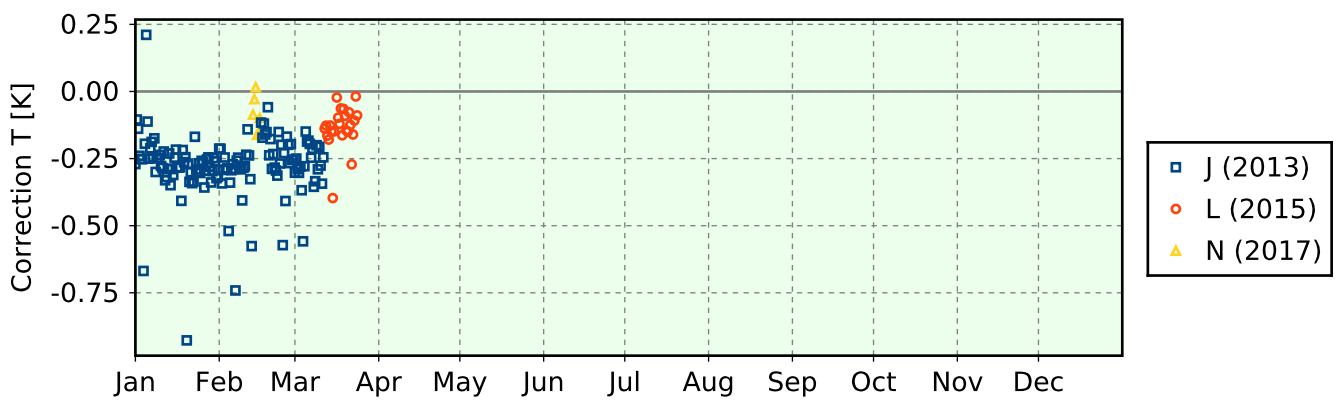
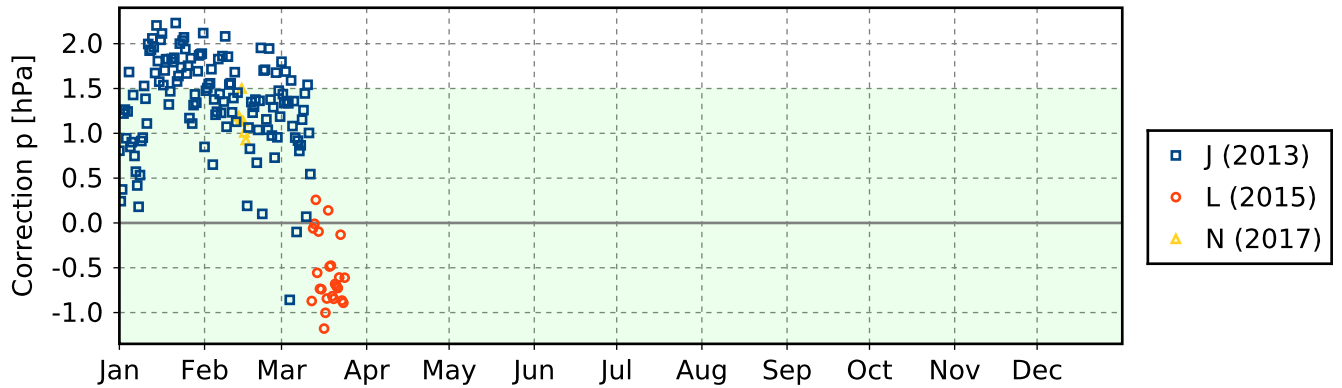
4.5 Instrument combinations of SOD-RS-02

Count	Instrument combination
553	RS41
164	RS92

4.6 Instrument ground check

4.6.1 Stream: RS92

(1) GroundCheck: GC-GC25



4.7 Measurement events

