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Session 7

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GRUAN Site Report for Ny-Ålesund

(Submitted by Marion Maturilli)

Summary and Purpose of this Document

Report from the GRUAN site Ny-Ålesund for the period January to December 2017.



GRUAN Site Report for Ny-Ålesund (NYA)

Reporting for the period January to December 2017

Date: 27-March-2018

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Overview

During the period January to March 2017, the RS92 was launched as standard radiosonde on a daily basis. Since April 2018, the standard radiosonde has switched to the RS41 radiosonde. In regard of change management, dual soundings with RS92-RS41 payload have been launched on a weekly basis throughout the entire reporting period. Overall, the period with weekly dual soundings will cover two complete years from March 2016 to March 2018. All RS92 and RS41 sounding and metadata are transmitted to the LC using the RSLaunchClient, thus contributing to the GRUAN data stream. During specific campaign activities, the frequency of soundings was increased to 4 per day.

Dataflow of GNSS data to GRUAN LC and the GRUAN GNSS processing centre at GFZ continues. Once formal data products have been defined, the Ny-lesund site may contribute to GRUAN data streams with lidar, microwave radiometer and ozone sonde data.

Change and change management

The transition RS92RS41 for the standard daily radiosonde was put into praxis on 1 April 2017. This transition is embedded in a two-year period with dual soundings on a weekly basis, between March 2016 and March 2018. In parallel to the radiosonde transition, also the receiving system / data acquisition has been changed, operating the MW41 Digicora system since April 2017 also to receive the RS92 data, thus providing *.mwx files instead of *.dc3db files. All dual sounding data are transferred to the LC using the RSLaunchClient. With the change in standard radiosonde, also the payload set-up for the CFH soundings has been adapted. Since May 2017, CFH is flown with a RS41 as transmitting radiosonde, with an ECC ozone sonde attached in a compact payload set-up.

Since the handling both of the receiving hardware as of the payload assembly has become easier, these soundings are now performed by the overwintering station personal after dedicated training.

Resourcing

The funding situation for the daily radiosonde measurements at the AWIPEV research base in Ny-Ålesund is currently settled. For sustainable financing of the bi-monthly CFH soundings it would be helpful if the CFH soundings became a GRUAN product.

Operations

We currently don't see any major challenges.

Site assessment and certification

Anytime ready for re-certification.

GRUAN-related research

The Ny-Ålesund site is contributing to the Task Team Sites. Other GRUAN-related research projects rather consider the scientific analysis of the long-term data set.

A recent publication referring to the Ny-Ålesund radiosonde data set is

Dahlke, S. and M. Maturilli (2017) Contribution of Atmospheric Advection to the Amplified Winter Warming in the Arctic North Atlantic Region, Advances in Meteorology. doi: 10.1155/2017/4928620

A recent publication combining the Ny-Ålesund long-term radiosonde data with radiosonde data from an expedition in the sea ice North of Svalbard is

Kayser, M., M. Maturilli, R. M. Graham, S. R. Hudson, A. Rinke, L. Cohen, J.-H. Kim, and M. A. Granskog(2017) Vertical thermodynamic structure of the troposphere during the Norwegian young sea ICE expedition (N-ICE2015), Journal of Geophysical Research, doi: 10.1002/2016JC026089

WG-GRUAN interface

We currently have no requests to the WG.

Items for ICM-10 plenary discussions

Within the scientific community I find little awareness of the high-quality GRUAN data. Now that more GRUAN data products are generated, it could be discussed how the network may become more visible.

Other archiving centers

The CFH data are archived at NDACC.

The Ny-Ålesund RS41 radiosonde data based on the manufacturer product are stored at www.pangaea.de (search term 'High resolution radiosonde measurements from station Ny-Ålesund').

Participation in campaigns

Regarding the radiosonde program, the launch frequency was increased to 4 radiosondes per day during the period 25 May to 21 June 2017 in the frame of the (AC)³ campaign [(AC)³ = Arctic Amplification: Climate Relevant Atmospheric and Surface Processes and Feedback Mechanisms]. Here, Ny-Ålesund was the land-based reference measurement site for other campaign activities by plane and on the sea ice reached by icebreaker *Polarstern*, with the focus on Arctic mixed-phase clouds. Simultaneous 4x daily radiosondes were also launched from the icebreaker North of Svalbard. The Ny-Ålesund campaign and long-term data are used to set the campaign period into a climatological context.

Another campaign period with 4x daily radiosoundings was between 29 August to 19 September 2017, in a cooperation with Japanese colleagues for *ARCROSE-2017* [ARCROSE= Arctic Research Collaboration for Radiosonde Observing System Experiment]. The aim of this collaboration is the optimization of data assimilation.

Future plans

Ny-Ålesund is participating in the Special Observing Periods of the Year of Polar Prediction (YOPP), increasing the radiosonde launch schedule to 4x daily soundings in the periods February and March, as well as July to September 2018.

Furthermore, the AWI section *Atmospheric Physics* has just moved into a new building, where we will also have lab facilities to assure a profound introduction to all relevant sounding procedures to our overwintering team that operates the sounding program at the AWIPEV research base in Ny-Ålesund, Svalbard.



GRUAN Site Report for NyAlesund (NYA), 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	NyAlesund
Unique GRUAN ID	NYA
Geographical position	78.9200 °N, 11.9400 °E, 5.0 m
Operated by	AWI Alfred-Wegener-Institut für Polarforschung, part of: HELMHOLTZ Helmholtz-Gemeinschaft
Main contact	Maturilli, Marion
WMO no./name	01004 NY-ALESUND II
Operators	currently 16, changes +3 / -5
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
NYA-GN-01	GNSS Site NYA2	GNSS	1	operational
NYA-RS-01	Ny-Aalesund Radiosonde Launch Site	Sounding Site	8	490

1.2 General comments from Lead Centre

1.2.1 General

Good communications between station and GRUAN LC.

Yearly training of station staff by GRUAN LC.

2 System: GNSS Site NYA2 (NYA-GN-01)

Object	Value
System name	GNSS Site NYA2
Unique GRUAN ID	NYA-GN-01
System type	GNSS (GN - GNSS)
Geographical position	78.5136 °N, 11.5212 °E, 49.1 m
Operated by	GFZ Deutsches GeoForschungsZentrum GFZ, part of: HELMHOLTZ Helmholtz-Gemeinschaft
Instrument contact	Ramatschi, Markus
Started at	2000-03-13
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 September 2013. This GNSS station is one of two test sites to implement the GNSS dataflow in GRUAN. The current dataflow includes manufacturer raw data, converted raw data (RINEX) and instrument logs, containing all equipment changes.

3 System: Ny-Aalesund Radiosonde Launch Site (NYA-RS-01)

Object	Value
System name	Ny-Aalesund Radiosonde Launch Site
Unique GRUAN ID	NYA-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	78.9230 °N, 11.9227 °E, 15.7 m
Operated by	AWI-POTSDAM Forschungsstelle Potsdam, part of: AWI Alfred-Wegener-Institut für Polarforschung, part of: HELMHOLTZ Helmholtz-Gemeinschaft
Instrument contact	Maturilli, Marion
Started at	-
Defined setups	8 (ROUTINE, OZONE, FLASH, CFH, DUAL1, ROUTINE2, OZONE2, CFH2)
Possible streams	CFH, ECC, RS41, RS92

3.1 Lead Centre comments

3.1.1 Change management

Weekly dual launches of Vaisala RS92-SGP and RS41-SGP are performed since March 2016 and submitted to the GRUAN LC.

3.1.2 Dataflow

Sonde dataflow to the GRUAN LC is operational since April 2012.

Now, the dataflow includes streams of the Vaisala RS41-SGP, RS92-SGP, ECC Ozone sonde, CFH water vapour, and Internet IMET-1. All launches are promptly submitted using the RsLaunchClient.

3.1.3 General

Change of operational sonde from Vaisala RS92-SGP to Vaisala RS41-SGP was on 1 April 2017.

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		6	6	
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3.2.2 Stream: ECC

ECC		66	66	
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3.2.3 Stream: RS41

RS41		415	415	
RS41-RAW	001		413	
RS41-EDT	001		413	

3.2.4 Stream: RS92

RS92		122	122	
RS92-INT	001		29	
RS92-RAW	001		92	
RS92-RAW	002		121	
RS92-EDT	001		121	
RS92-GDP	002		101	90

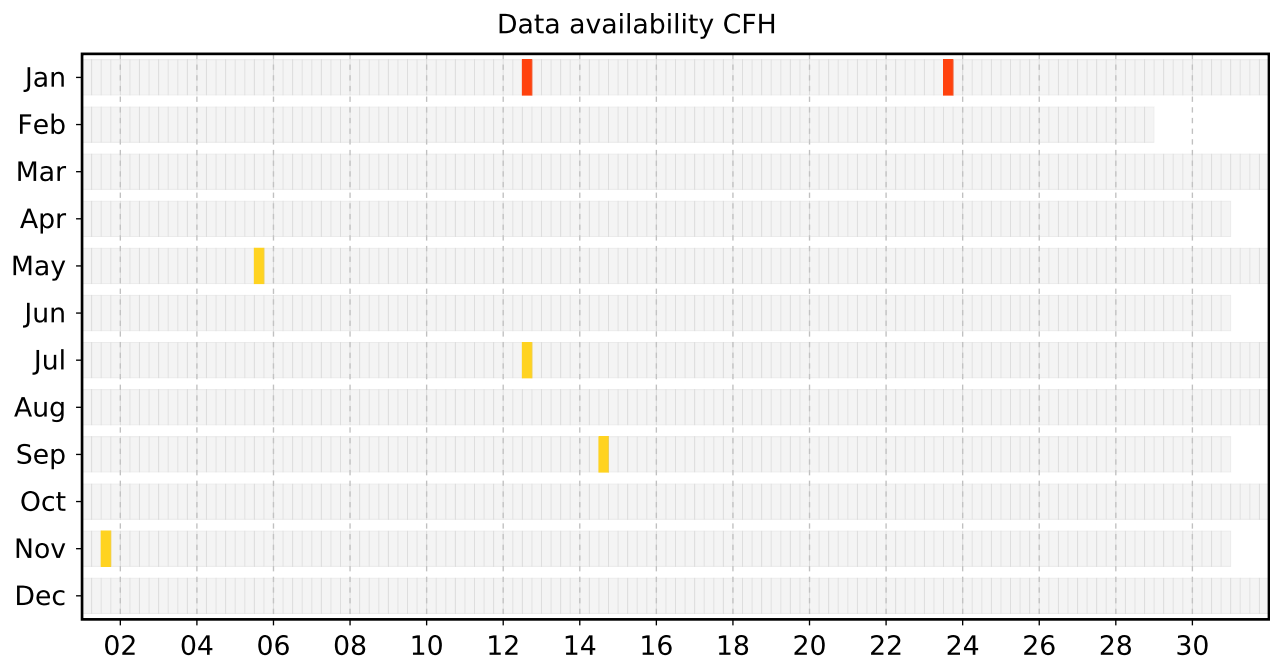
3.3 Data availability of data products

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).

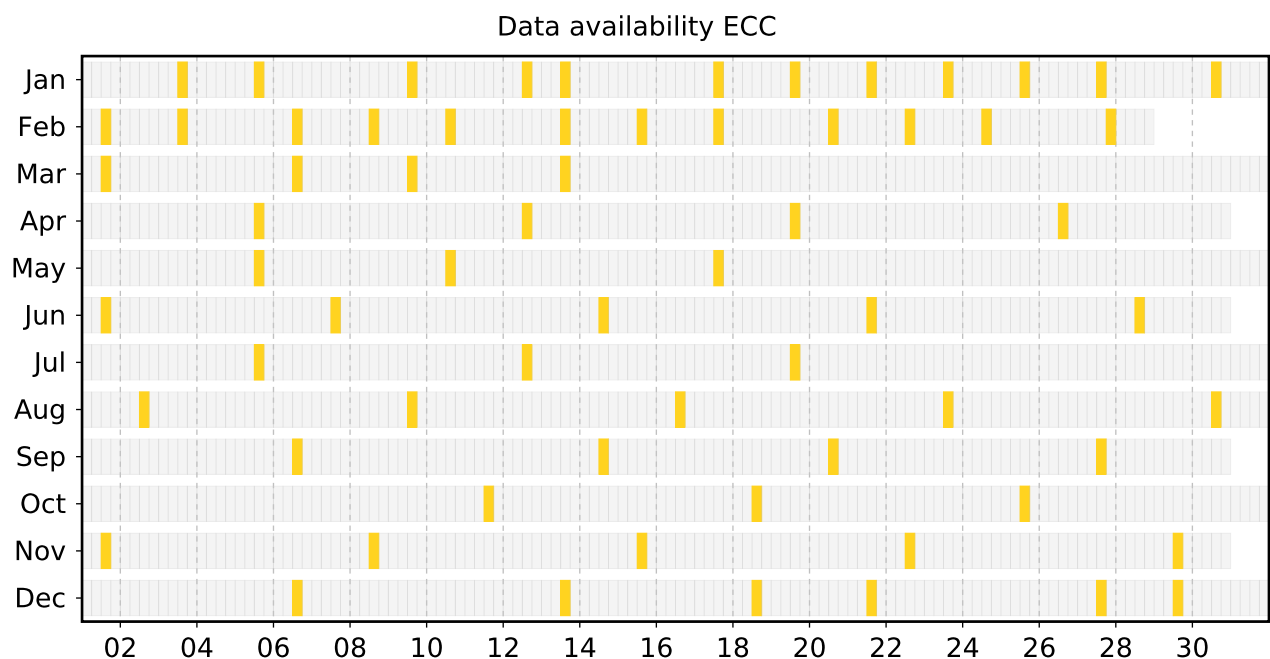
Unprocessed (yellow): The raw data file has been successfully converted to a GRUAN standardized raw data file format (NetCDF). The processing (e.g. GRUAN data processing) has not yet been done, or has not been completed. Reason may be a processing routine which does not yet exist, or software errors.

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

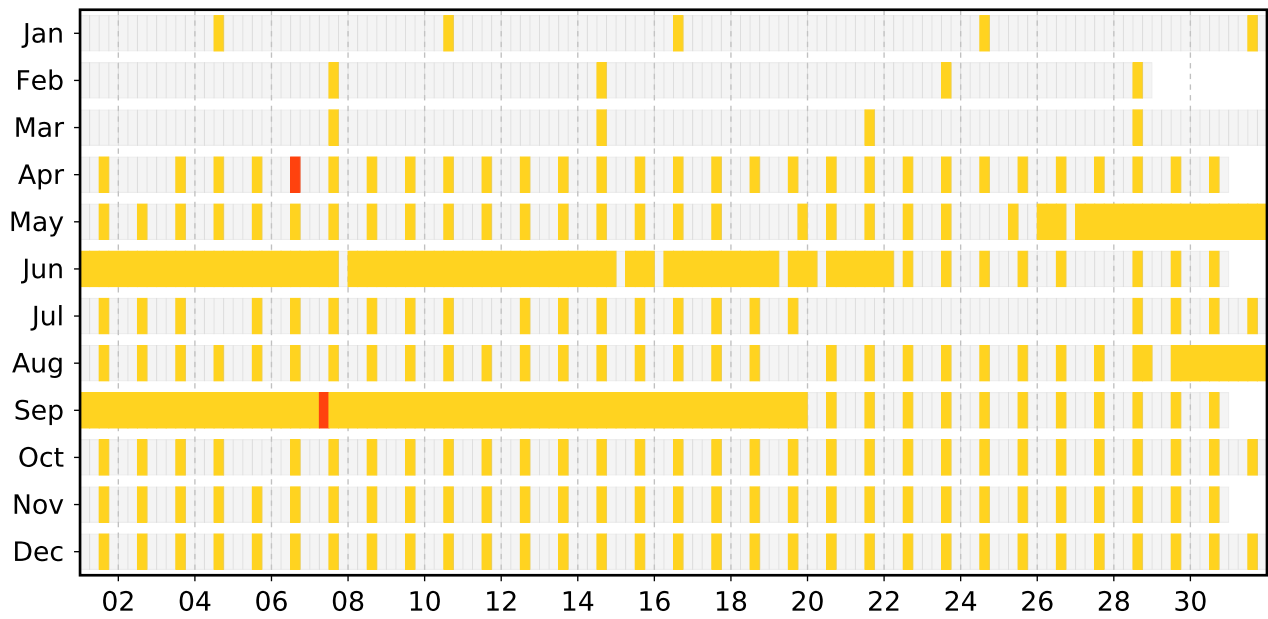


3.3.2 Stream: ECC



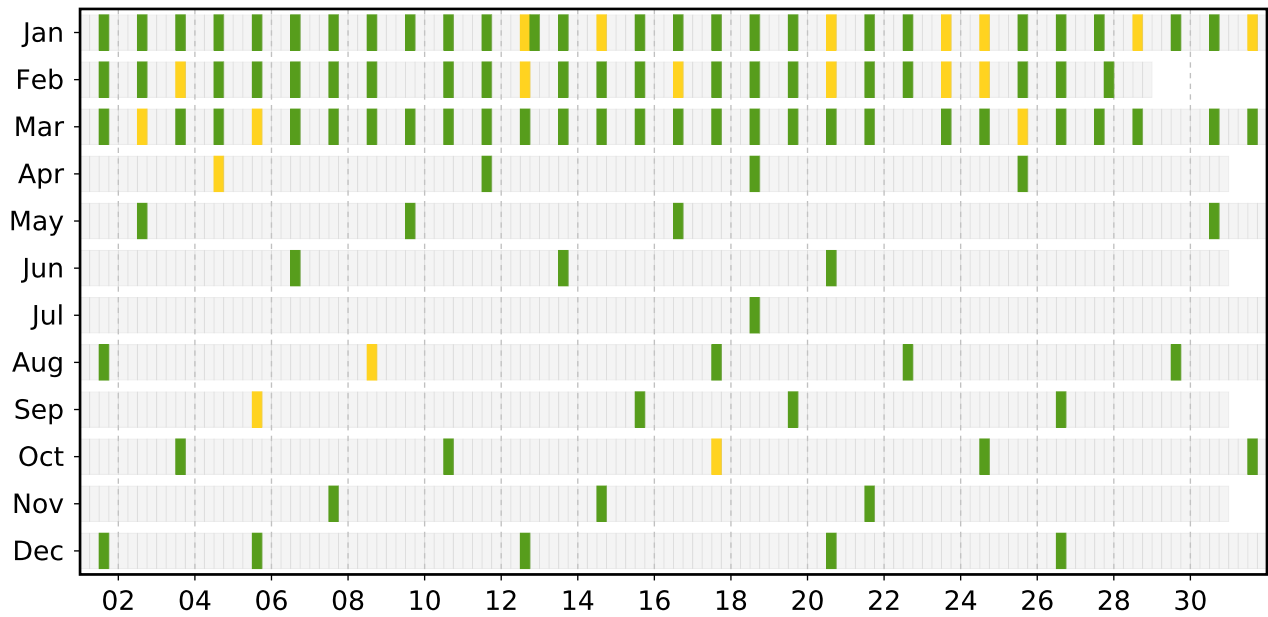
3.3.3 Stream: RS41

Data availability RS41



3.3.4 Stream: RS92

Data availability RS92



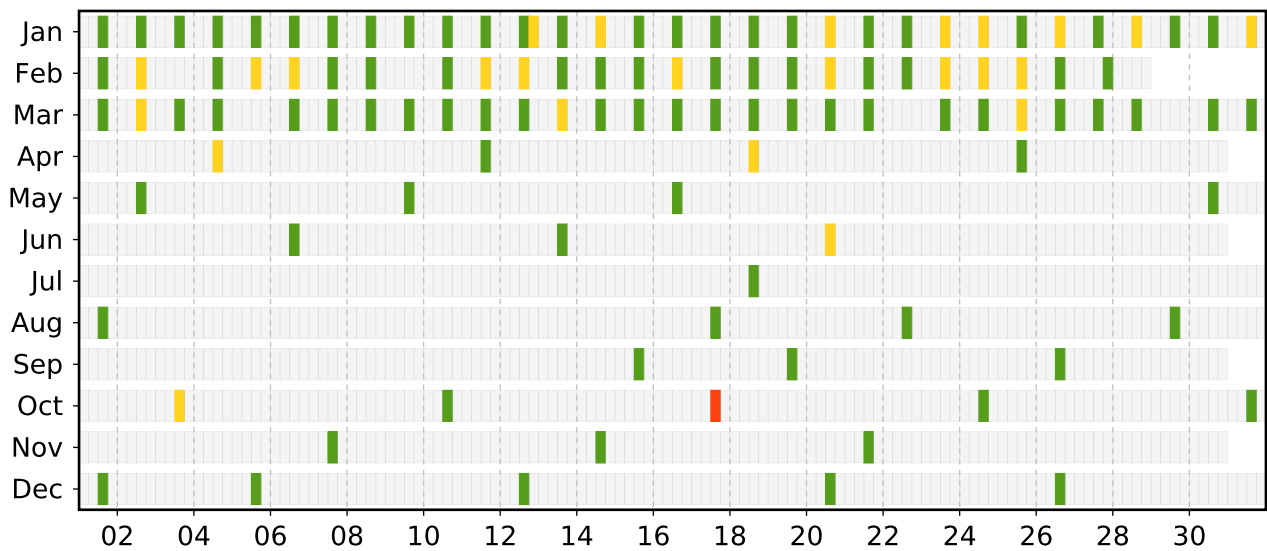
3.4 Data quality of current GRUAN data products

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

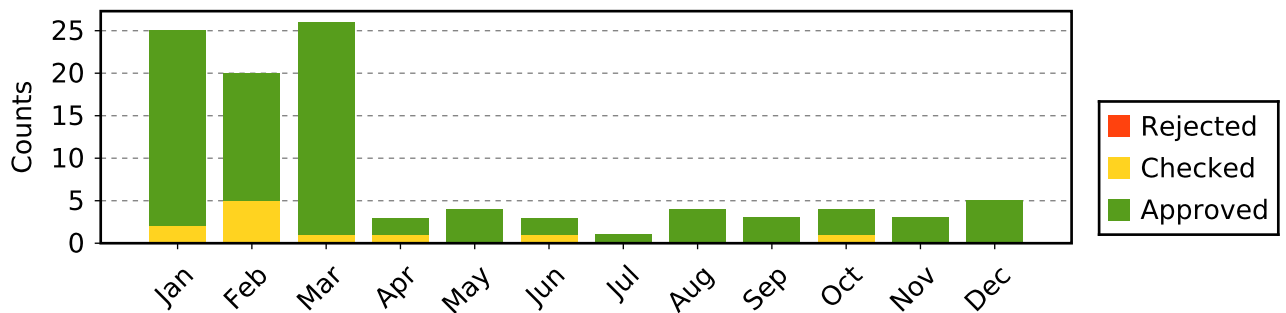
3.4.1 Stream: RS92 (Product: RS92-GDP-002)

Jan	25	23	2				2		7
Feb	20	15	5				5		10
Mar	26	25	1				1		4
Apr	3	2	1				1		
May	4	4							
Jun	3	2	1				1		
Jul	1	1							
Aug	4	4							
Sep	3	3							
Oct	4	3	1						2
Nov	3	3							1
Dec	5	5							1
Sum	101	90	11				10		25

Data quality of stream RS92



Data quality statistic of stream RS92



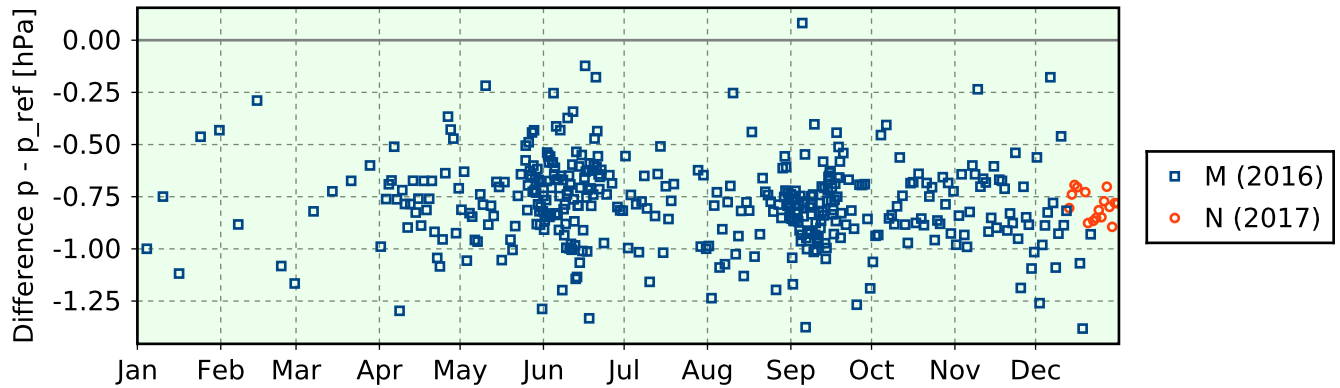
3.5 Instrument combinations of NYA-RS-01

Count	Instrument combination
4	CFH, ECC, RS41
2	CFH, ECC, RS92
34	ECC, RS41
26	ECC, RS92
330	RS41
47	RS41, RS92
47	RS92

3.6 Instrument ground check

3.6.1 Stream: RS41

(1) GroundCheck: GC-RI41

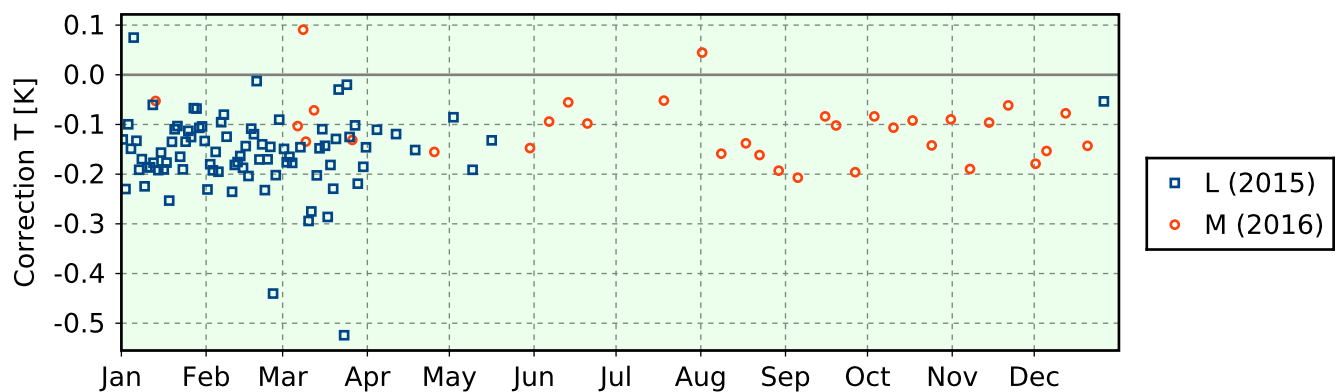
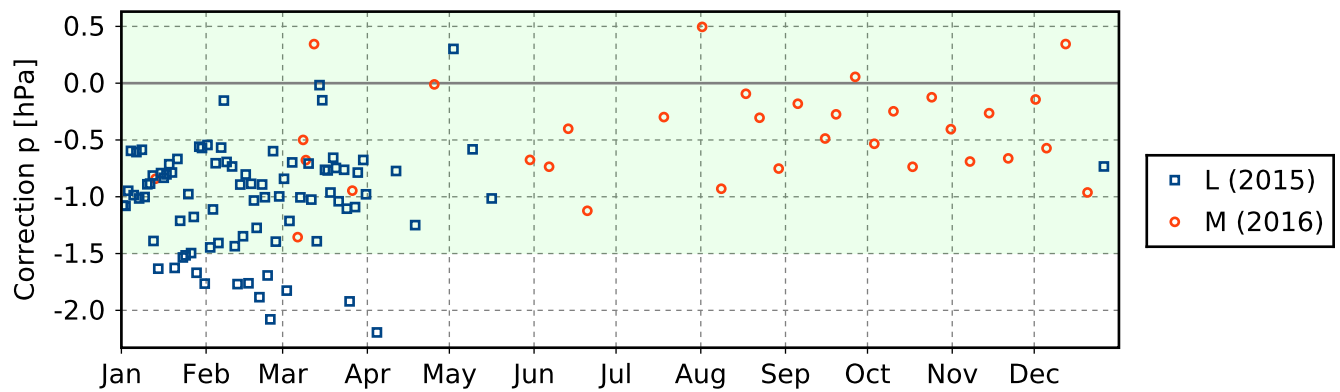


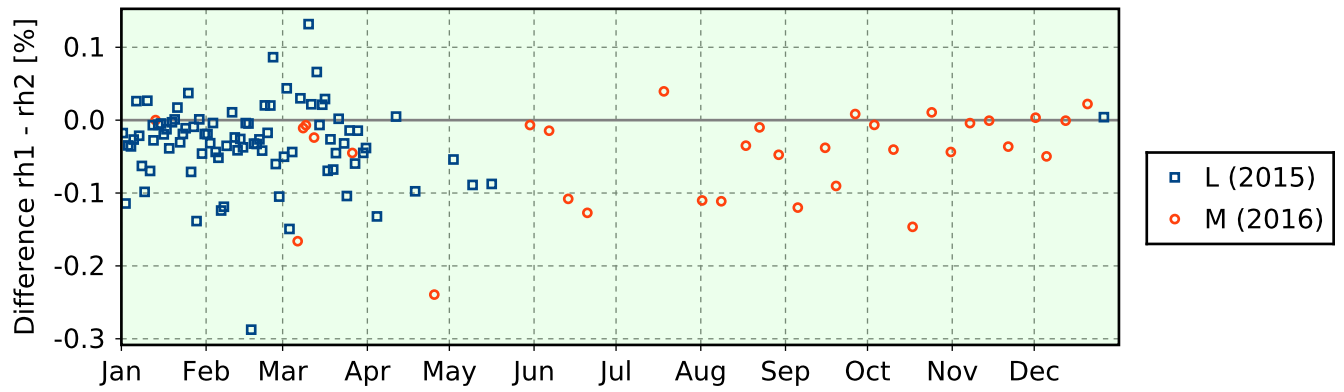
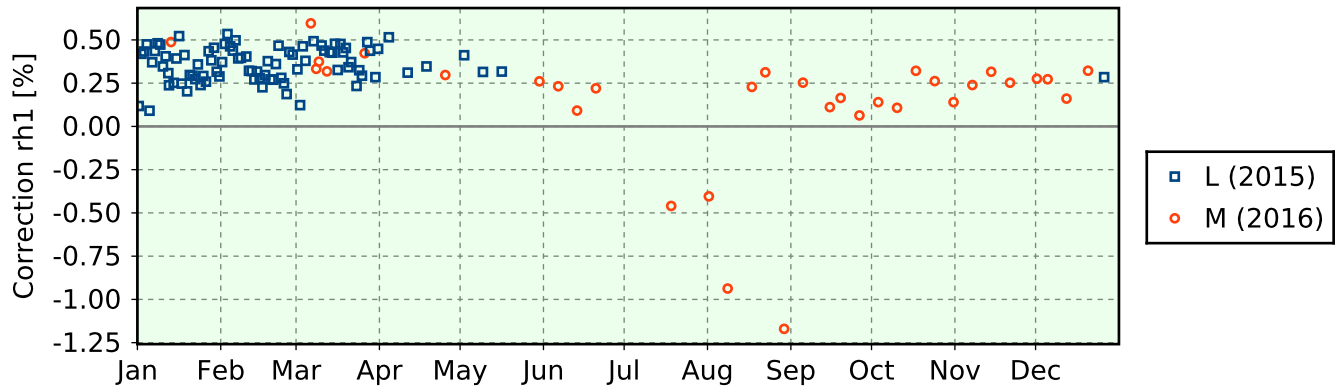
(2) GroundCheck: GC-SHC

(3) GroundCheck: GC-SHELTER

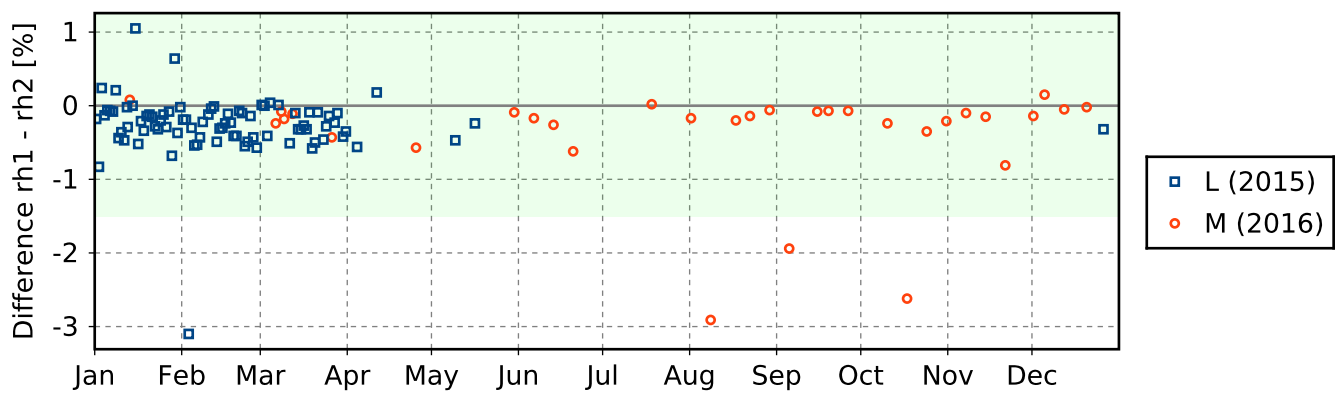
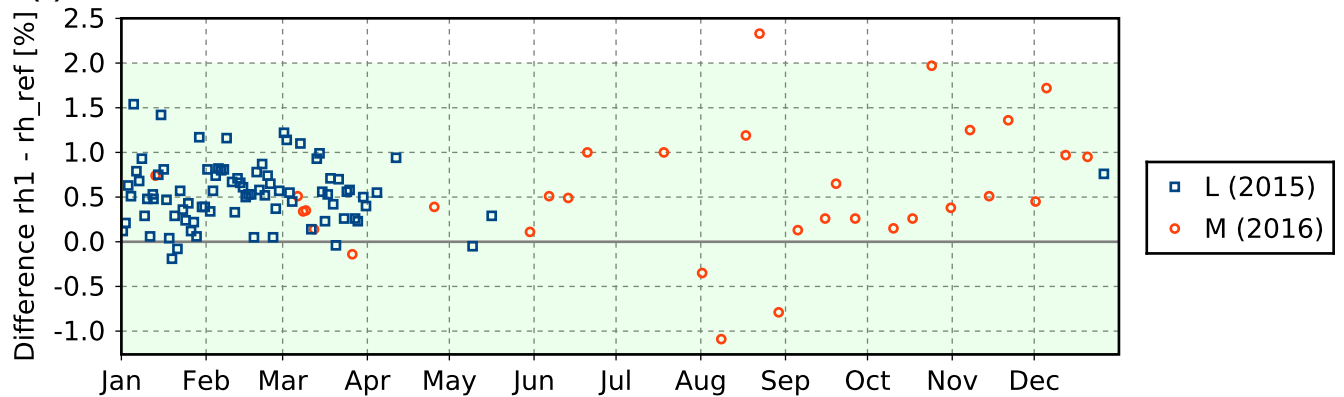
3.6.2 Stream: RS92

(1) GroundCheck: GC-GC25





(2) GroundCheck: GC-SHC



(3) GroundCheck: GC-SHELTER

3.7 Measurement events

