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GLOBAL CLIMATE OBSERVING  
SYSTEM (GCOS)

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**12th GRUAN Implementation-  
Coordination Meeting (ICM-12)**

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Session 1

Virtual

16 - 20 November 2020

## GRUAN Site Report for Ny-Ålesund

*(Submitted by Marion Maturilli)*

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

Report from the GRUAN site Ny-Ålesund for the period January to December 2019.

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## **Overview**

The Ny-Ålesund site is contributing to GRUAN with its sounding program and according data streams for RS41, ECC and CFH. The daily radiosonde data, weekly ozone sonde data, and bi-monthly CFH data are promptly submitted to GRUAN LC, no problems are apparent. Furthermore, Ny-Ålesund 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; operational processing as GNSS-PW-GDP is performed. In the future, Ny-Ålesund may contribute with lidar and microwave radiometer data streams once formal data products have been defined.

## **Change and change management**

During 2019, no changes to the operation procedures have occurred. All GRUAN data streams were retrieved in routine operation. The annual staff exchange in April resulted in the introduction of new operators for the sounding program. The new staff had been trained on the sounding procedures already at the home institution prior to travel to the station. No further changes to the operations.

## **Resourcing**

As we rely on helium for the balloons, the drastic increase in helium cost puts pressure on future campaign activities with additional soundings. The daily routine sounding is currently unquestionable.

## **Operations**

Operational challenges at Ny-Ålesund are mostly related to environmental issues. The necessity of R23 for CFH operation is critical, and we support efforts that are taken to develop a replacement. For logistical reasons, it is impossible to recover even the large payloads after flight, as they land either in the ocean or on inaccessible ground. In Arctic climate conditions, the decomposition of any sounding material is decelerated, and there is a growing awareness of the public that the soundings result in waste being left in the environment. Requests in this regard have already been brought up to the station on several occasions. As for the justification of the sounding program to the public, we would appreciate a general statement from official side to back up our replies.

## **Site assessment and certification**

The Ny-Ålesund site has been re-certified in 2018.

## **GRUAN-related research**

At Ny-Ålesund, we try to support the development of new instrumentation to replace the R23-dependent CFH instruments. For example, in February 2020 Teresa Jorge from ETH Zürich spent 4 weeks at the station to have test flights with the newly developed Peltier-cooled frostpoint hygrometer together with CFH. The evaluation of these flights is ongoing, and hopefully the dual frostpoint hygrometer soundings under Arctic conditions contributed to the improvement of the Peltier-cooled version.

Also at Ny-Ålesund, radiative flux profiles have been measured using a tethered balloon system, providing valuable insight in regard to radiation corrections etc (see Becker et al., 2020).

The Ny-Ålesund site representative Marion Maturilli is supporting the network as co-chair for the GRUAN Task Team Sites. She has also contributed to the Technical Note TD-7 “Review of Multiple payload Radiosonde Sounding Configurations for Determining Best-Practice Guidance for GRUAN Sites”.

Furthermore, Ny-Ålesund (GRUAN) site scientists contributed to the study Rinke, A., Segger, B., Crewell, S., Maturilli, M., Naakka, T., Nygård, T., Vihma, T., Alshawaf, F., Dick, G., Wickert, J., Keller, J. (2019): Trends of Vertically Integrated Water Vapor over the Arctic during 1979-2016: Consistent Moistening All Over? - *Journal of Climate*, 32, 18, 6097-6116. doi: 10.1175/JCLI-D-19-0092.1

## **WG-GRUAN interface**

In regard to the environmental issues mentioned under “Operations”, could the GRUAN-WG find out if potentially an official statement (by WMO / GCOS) already exists that explains the need to launch radiosondes? [in particular: to launch radiosondes that are left as waste to the environment, while e.g. remote sensing could be less invasive to nature] Otherwise, could the WG-GRUAN develop such a document, so that stations that are confronted with the public can refer to it?

## **Other archiving centers**

The Ny-Ålesund RS41 data based on the manufacturer product are stored at [www.pangaea.de](http://www.pangaea.de) (Maturilli et al., 2020; doi: 10.1594/PANGAEA.914973). CFH data are archived at NDACC. (Also ozone sonde data and lidar data are archived at NDACC. Surface radiation data contribute to BSRN.)

## **Participation in campaigns**

In 2019, there was no particular GRUAN-related campaign activity at Ny-Ålesund.

## **Future plans**

In February 2020, dual launches of CFH with the Peltier-cooled frostpoint hygrometer of ETH Zürich were performed at Ny-Ålesund. We are currently waiting for the evaluation of these measurements, and expect to have additional test flights at Ny-Ålesund with an improved version of the Peltier-cooled instrument in the future.



# GRUAN Site Report for NyAlesund (NYA), 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	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 18, changes +3 / -9
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	9	367

### 1.2 General comments from Lead Centre

No comments from Lead Centre.

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

<b>Object</b>	<b>Value</b>
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.

The operational processing as GNSS-PW-GDP is performed.

### 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	9 (ROUTINE, OZONE, FLASH, CFH, DUAL1, ROUTINE2, OZONE2, CFH2, RESEARCH)
Possible streams	CFH, COBALD, ECC, RS-11G, RS41, RS92

#### 3.1 Lead Centre comments

##### 3.1.1 Dataflow

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

Currently, the dataflow includes streams of the Vaisala RS41-SGP, ECC Ozone sonde, and CFH water vapour. All launches are promptly submitted using the RSLaunchClient.

A regular measurement program for the observation of stratospheric water vapor was performed using CFH.

#### 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		67	67	
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##### 3.2.3 Stream: RS41

RS41		367	367	
RS41-GCA	001		344	
RS41-RAW	001		367	
RS41-EDT	001		367	
RS41-GDP-ALPHA	001		44	
RS41-GDP-ALPHA	002		250	
RS41-GDP-ALPHA	003		73	
RS41-GDP-BETA	001		125	

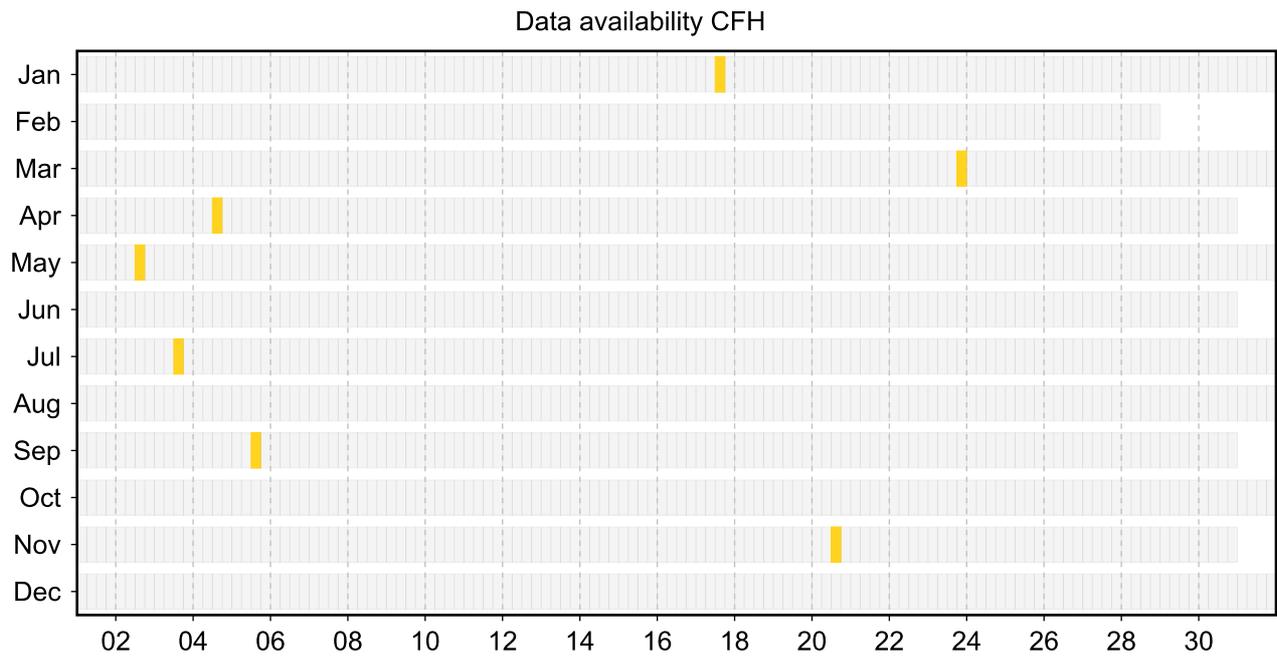
### 3.3 Availability of data products

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).

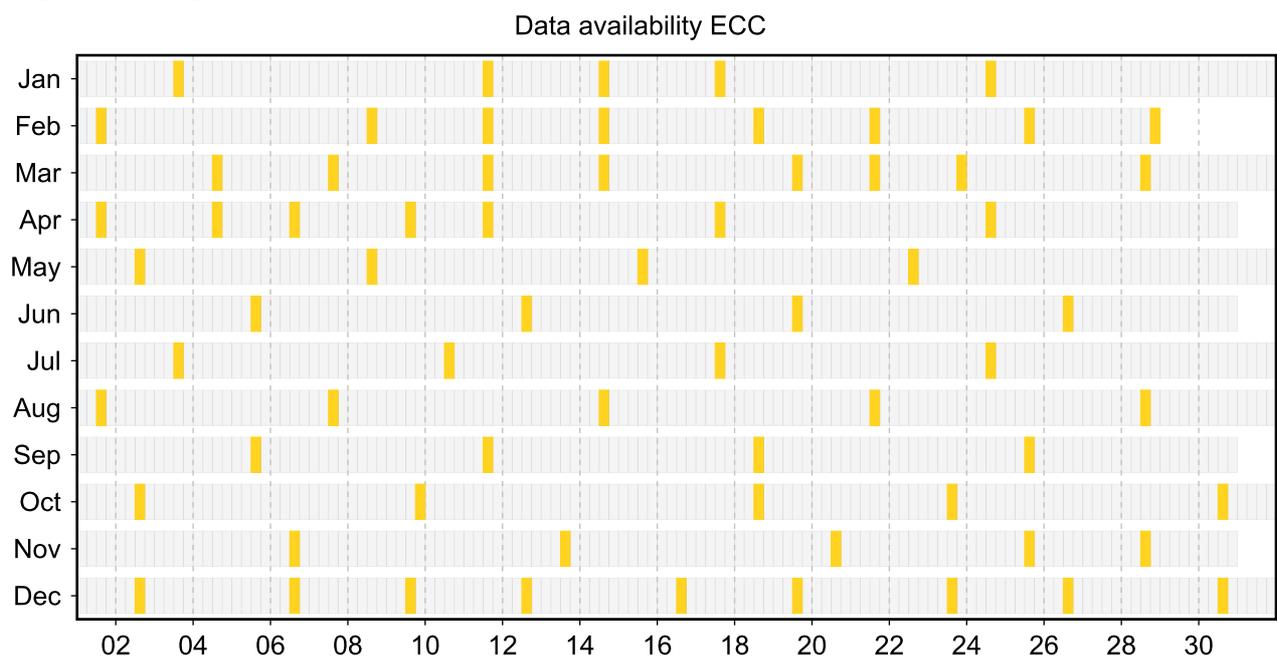
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

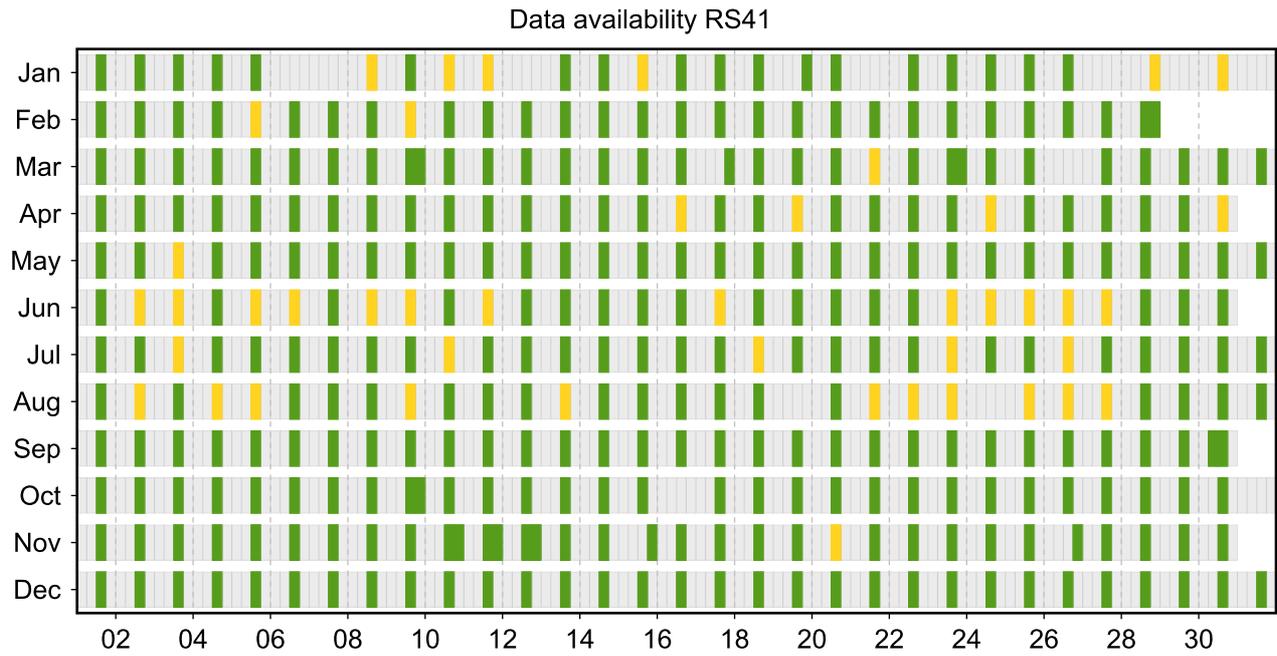
#### 3.3.1 Stream: CFH



#### 3.3.2 Stream: ECC



### 3.3.3 Stream: RS41



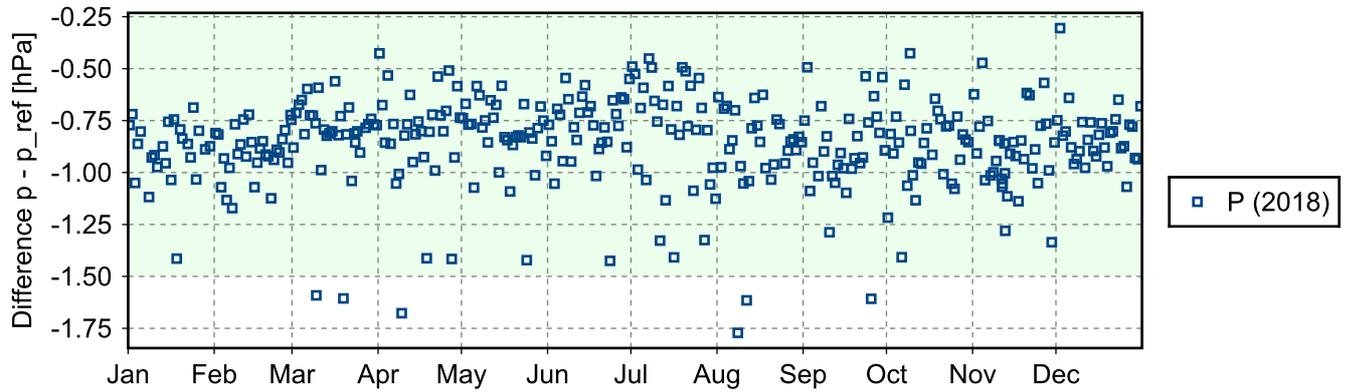
### 3.4 Instrument combinations of NYA-RS-01

Count	Instrument combination
6	CFH, ECC, RS41
61	ECC, RS41
300	RS41

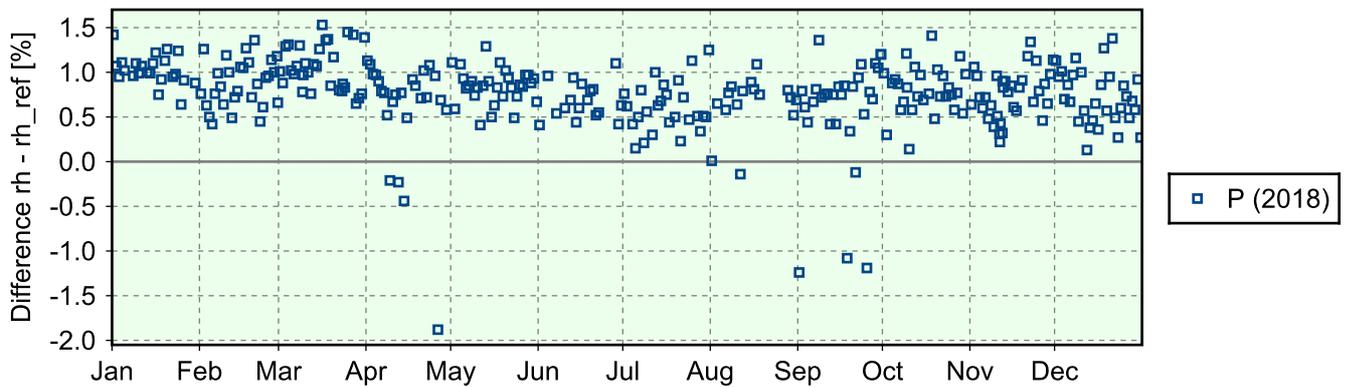
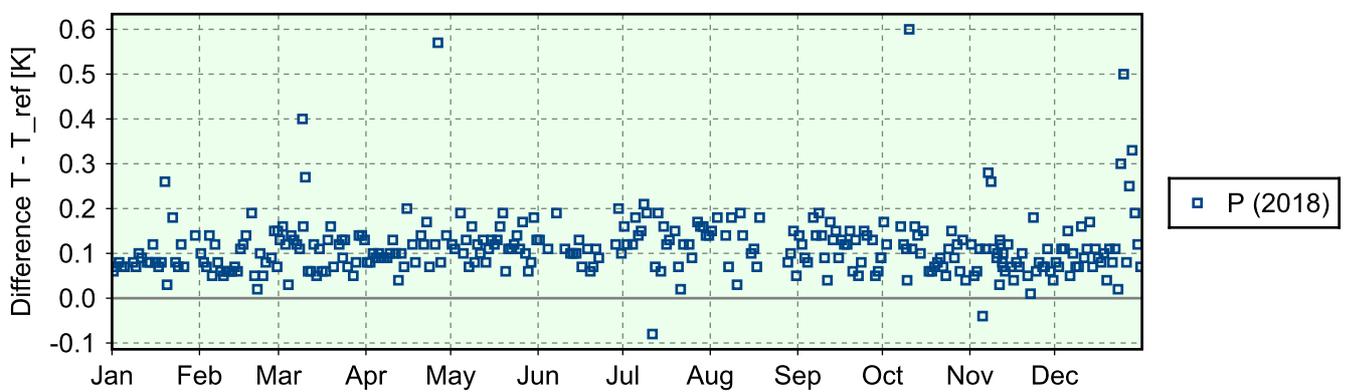
### 3.5 Instrument ground check

#### 3.5.1 Stream: RS41

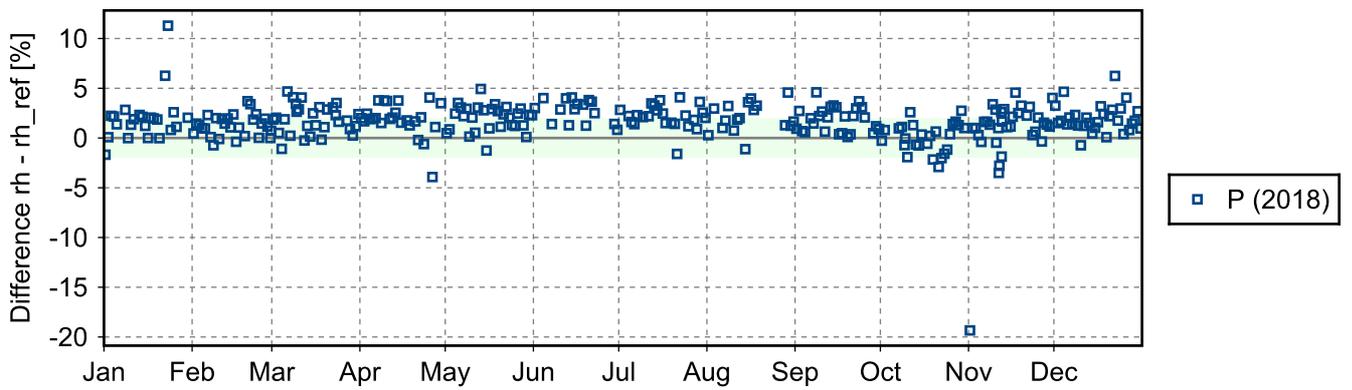
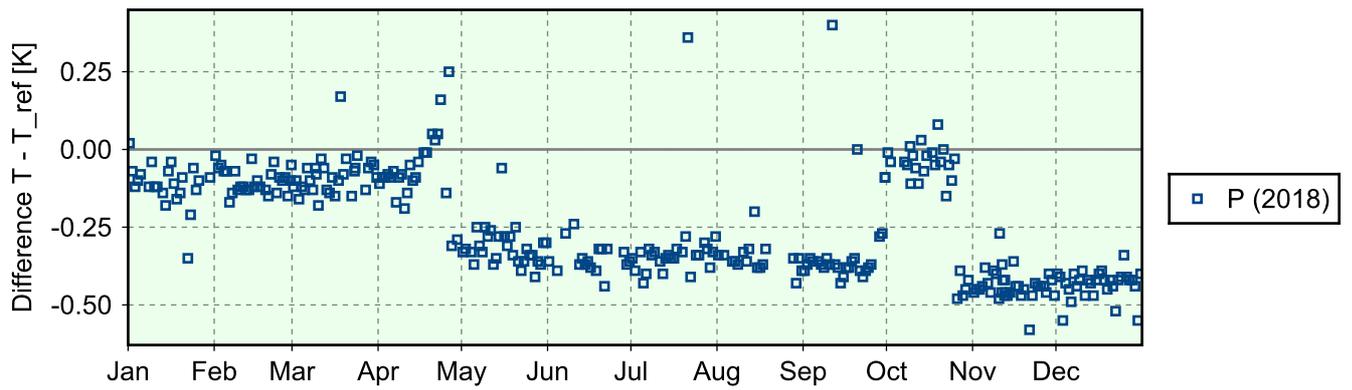
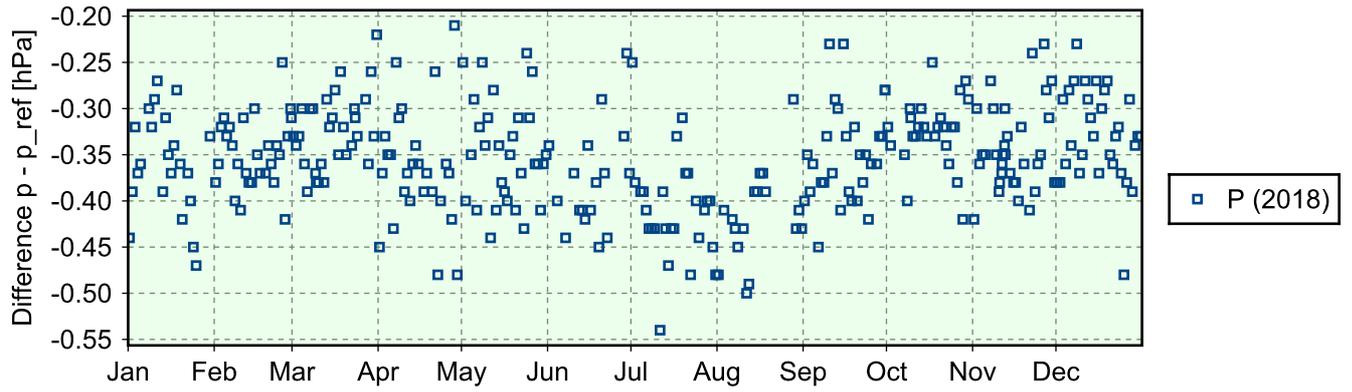
(1) GroundCheck: GC-RI41



(2) GroundCheck: GC-SHC



**(3) GroundCheck: GC-SHELTER**



**3.6 Measurement events**

