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GLOBAL CLIMATE OBSERVING SYSTEM (GCOS)

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Session 3

GRUAN Site Report for Beltsville

(Submitted by Belay B. Demoz)

Summary and Purpose of this Document

Report from the GRUAN site Beltsville for the period January 2024 to December 2024.

Overview

Beltsville is located at Howard University Beltsville Campus (HUBC). It contributes with weekly RS92-RS41 and monthly CFH data and GNSS station. The site was certified this year and has made the measurements consistently and data is available under the identifier BEL-GN-01 and BEL-RS-01 for GNSS and RS41 data. The has completed the homogenization of all the historical ozone profiles, launched at the site. In addition, Beltsville has been a primary participant in the multi-agency year-long experiment called CoURAGE. In addition, the site contributes with all dual RS92-RS41 launches and ozone launches.

Change and change management

Beltsville has not changed its launch criteria and/or instrument. Our collaboration with NWS-Sterling has allowed continuation of similar multi-package flights. However, the NOAA collaboration work has been inconsistent because of the current administration operational issues. No changes in operating procedures to date.

Resourcing

Mr. Adrian Flores and Ms Rocio Rossi have been managing the day to day GRUAN activity at Beltsville with Dr. Demoz and Sakai assisting in strategy and planning. We are grateful for the support of the NOAA Center for Atmospheric Science and Meteorology (NCAS-M) and its Director, Dr. Sen Chiao. While the scientist level of Howard staff is gaining, the cost of running the CFH and personnel is always a challenge and one-proposal decline away. We always acknowledge the support from Dr. Howard Diamond for operating the CFH at this site – it is our lifeline for this part of the GRUAN work.

Operations

We continue to improve our capability and have been testing several versions of the CFH modifications in collaboration with Holger Vömel. The price of R23 cryogen has increased astronomically and

is not sustainable, even if allowed for use in the US. GNSS had some issues but is operating again. We continue to coordinate with satellite overpasses and have targeted several.

Site assessment and certification

Site is certified and re-certified

GRUAN-related research

We had a year-long work in association with DoE ARM funded deployment about 20 miles north of the site called the Coast-Urban-Rural Atmospheric Gradient Experiment (CoURAGE). A large number of soundings were launched in Urban Baltimore and two rural sites to west and east. All sondes are RS41, supported by extensive ground profilers and in-situ measurements of chemistry and state parameters. See details here: `https://armgov.svcs.arm.gov/research/campaigns/amf2024courage`

WG-GRUAN interface

This sites GRUAN operation is primarily funded through a collaboration with NOAA-STAR and primarily the advocacy and partial funding from Dr. Howard Diamond and Dr. Satya Calluri. Any recognition, when appropriate, that GRUAN leadership and the WG-GRUAN would offer these folks strengthens our funding chances.

Other archiving centers

Beltsville also contributes to both NDACC and SHADOZ networks

Participation in campaigns

CoURAGE: This deployment will create a four-node regional atmospheric observatory network including Baltimore and its three primary surrounding environments rural, urban, and bay. It is a year-long effort of coordinated sonde launches.

Future plans

Immediate plans are to continue the operation and no major changes are planned.

GRUAN Site Report for Beltsville (BEL), 2024

Reported time range is Jan 2024 to Dec 2024
Created by the Lead Centre
Version from 2025-11-06

1 General GRUAN site information

Object	Value
Station name	Beltsville
Unique GRUAN ID	BEL
Geographical position	39.0500 °N, -76.8800 °W, 53.0 m
Operated by	HOWARD | Howard University
Main contact	Demoz, Belay
WMO no./name	-
Operators	currently 17, changes +1 / -10
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
BEL-GN-01	GNSS Site HUBC	GNSS	1	operational
BEL-RS-01	Beltsville Radiosonde Launch Site	Sounding Site	8	91

1.2 General comments from Lead Centre

No comments from Lead Centre.

2 System: GNSS Site HUBC (BEL-GN-01)

Object	Value
System name	GNSS Site HUBC
Unique GRUAN ID	BEL-GN-01
System type	GNSS (GN - GNSS)
Geographical position	39.0541 °N, -76.8775 °W, 25.3 m
Operated by	HOWARD | Howard University
Instrument contact	Demoz, Belay
Started at	2021-03-05
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC and to the GRUAN GNSS processing centre at GFZ has started in May 2022. The current dataflow includes manufacturer raw data, converted raw data (RINEX), instrument logs, and processed data.

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

3 System: Beltsville Radiosonde Launch Site (BEL-RS-01)

Object	Value
System name	Beltsville Radiosonde Launch Site
Unique GRUAN ID	BEL-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	39.0520 °N, -76.8775 °W, 52.0 m
Operated by	HOWARD | Howard University
Instrument contact	Demoz, Belay
Started at	-
Defined setups	8 (RESEARCH, ROUTINE, OZONE, ROUTINE2, OZONE2, ROUTINE3, OZONE3, DUAL1)
Possible streams	CFH, ECC, RS41, RS92

3.1 Lead Centre comments

3.1.1 Dataflow

Operational dataflow of radiosonde measurement data to the GRUAN LC since August 2014. The dataflow includes radiosoundings with Vaisala RS41-SG, ECC Ozone and CFH. All data are transmitted using the RsLaunchClient.

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

3.1.2 Data quality

Remarkable increase of SHC RH check for RS41 V-batch are visible.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
3.2.1 Stream: CFH				
CFH		10	10	
3.2.2 Stream: ECC				
ECC		39	39	
3.2.3 Stream: RS41				
RS41		70	70	
RS41-RAW	001		70	
RS41-EDT	001		70	
RS41-GDP	001		70	
3.2.4 Stream: RS92				
RS92		21	21	
RS92-RAW	002		21	
RS92-EDT	001		21	
RS92-GDP	002		20	

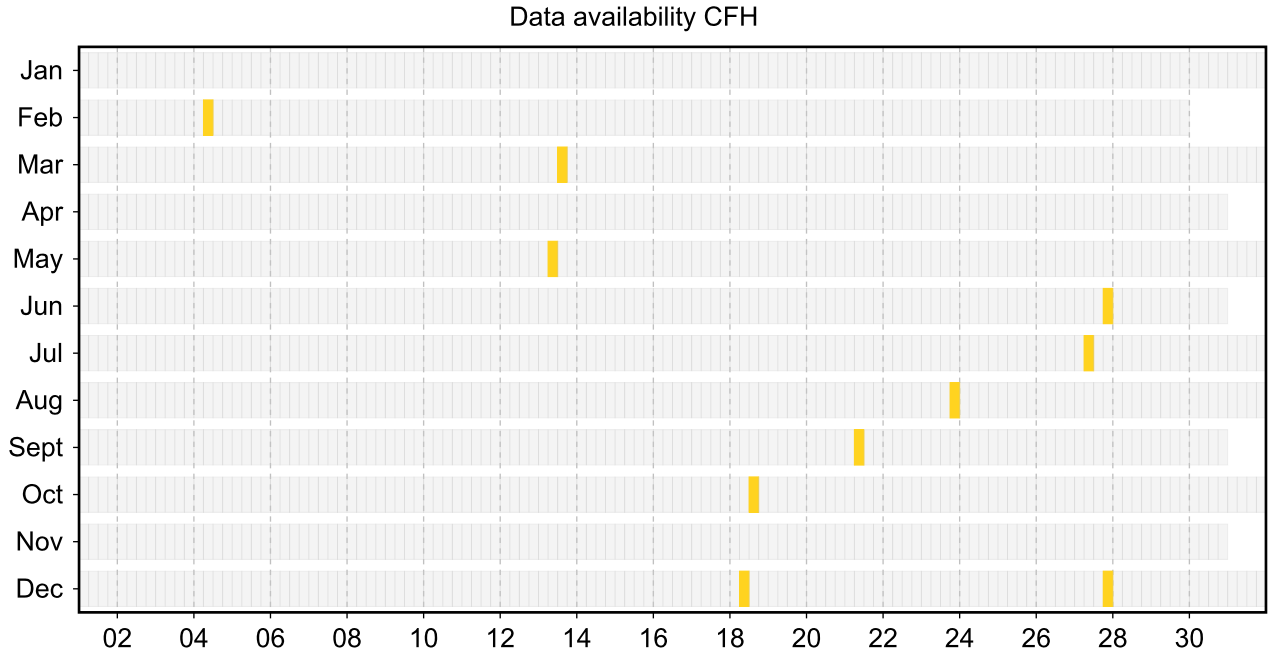
3.3 Availability of data products

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).

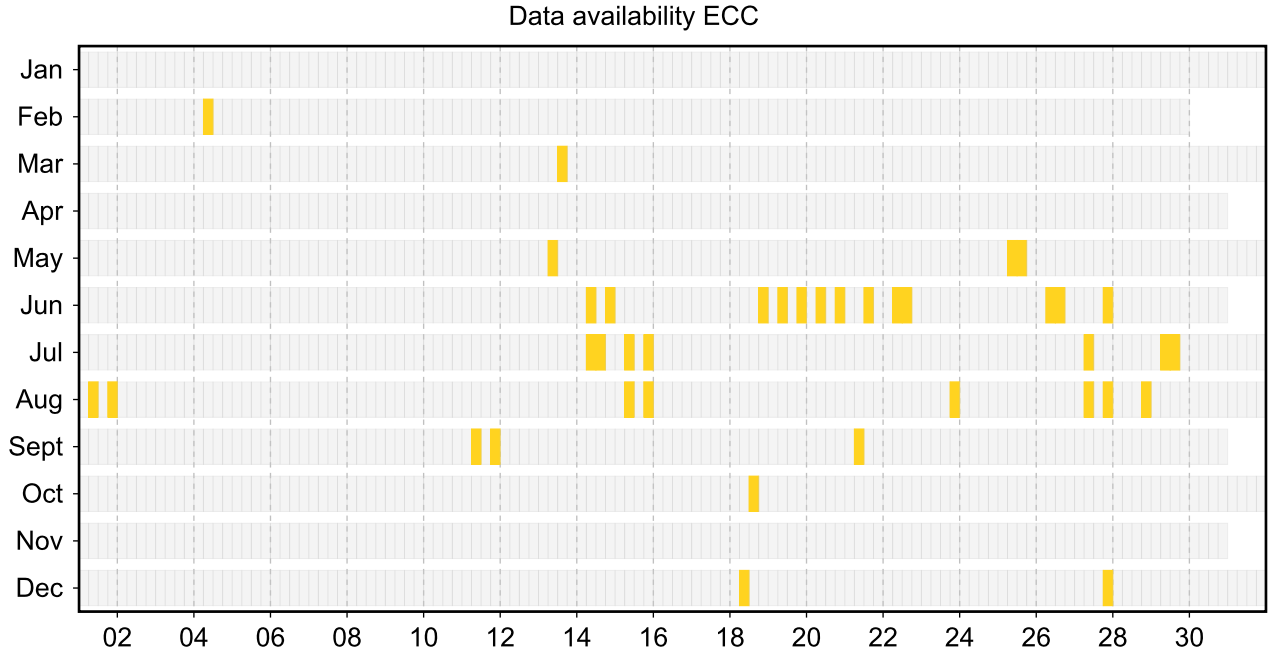
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

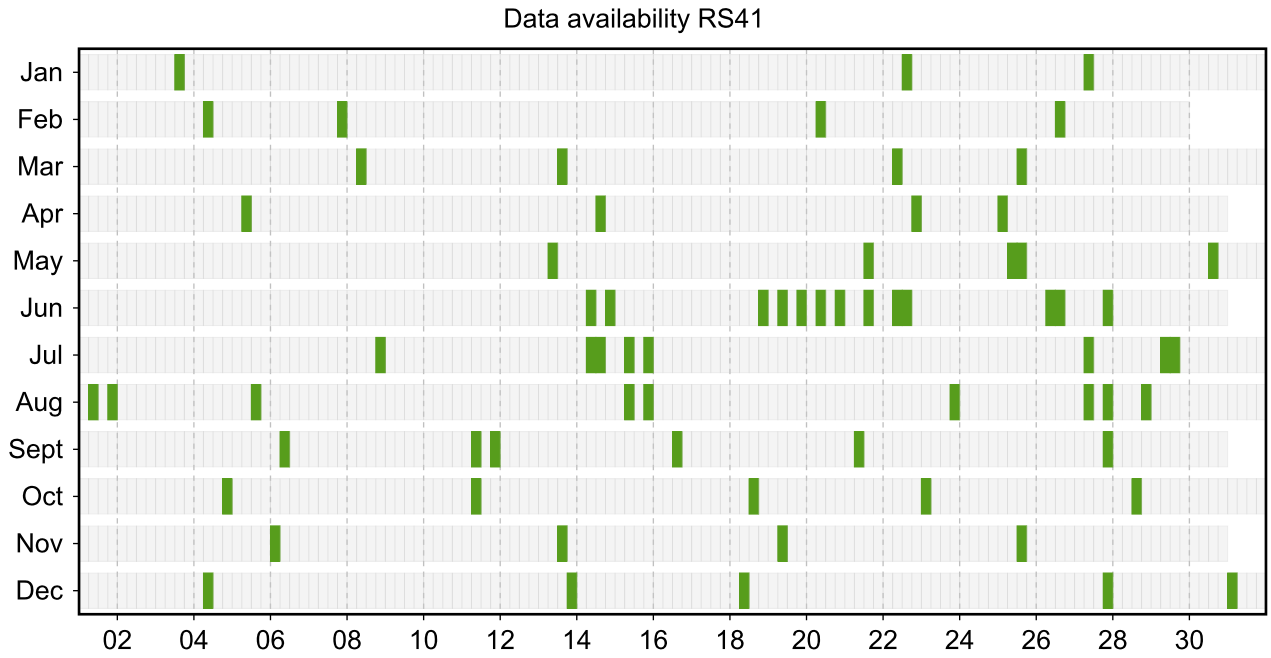
3.3.1 Stream: CFH



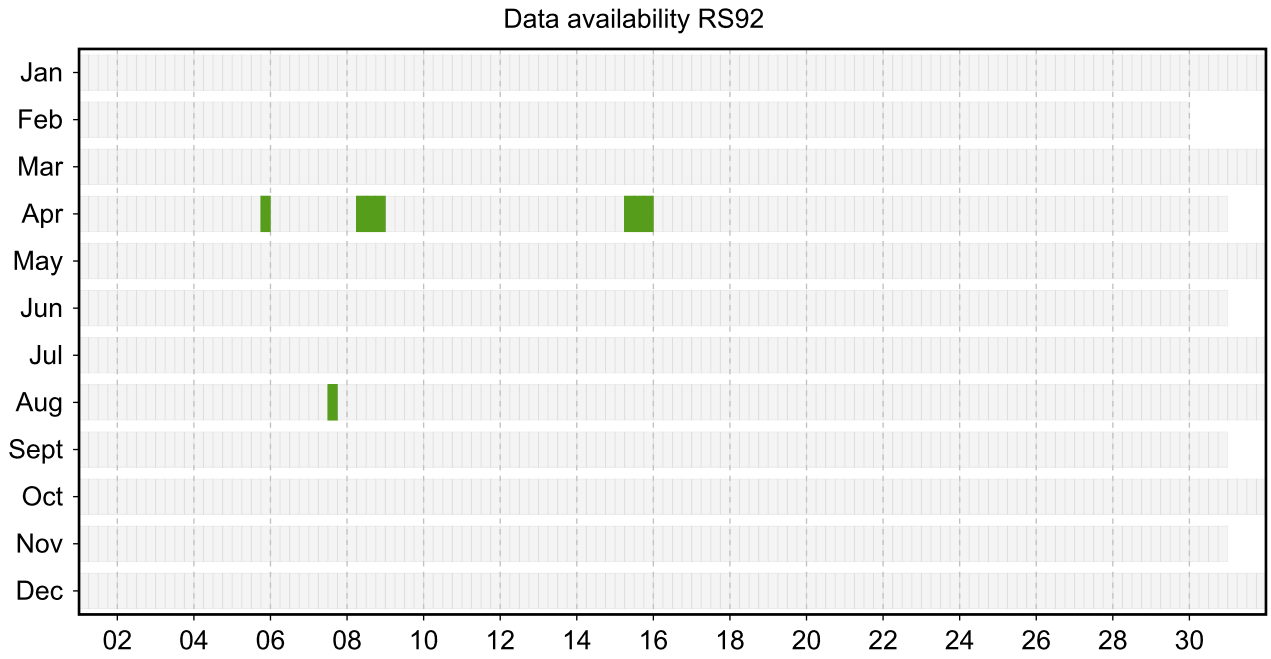
3.3.2 Stream: ECC



3.3.3 Stream: RS41



3.3.4 Stream: RS92



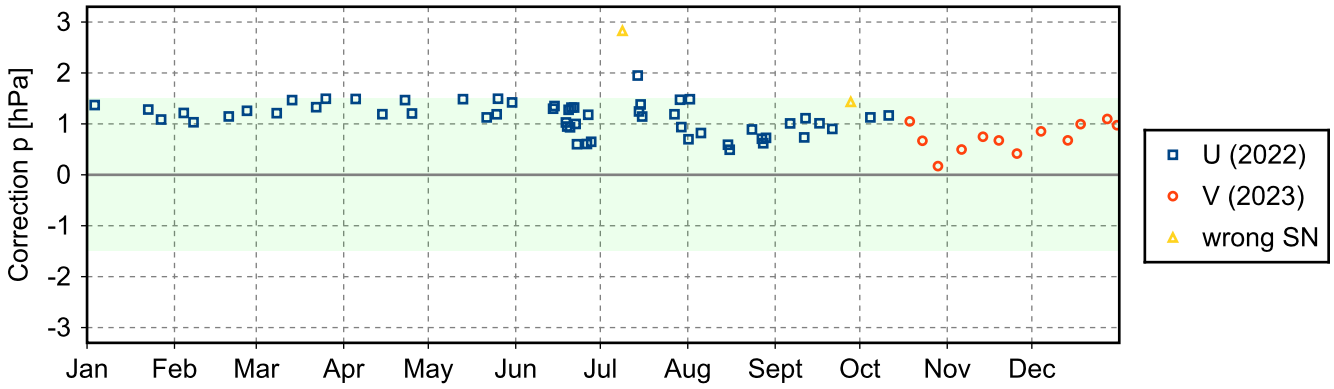
3.4 Instrument combinations of BEL-RS-01

Count	Instrument combination
10	CFH, ECC, RS41
29	ECC, RS41
31	RS41
21	RS92

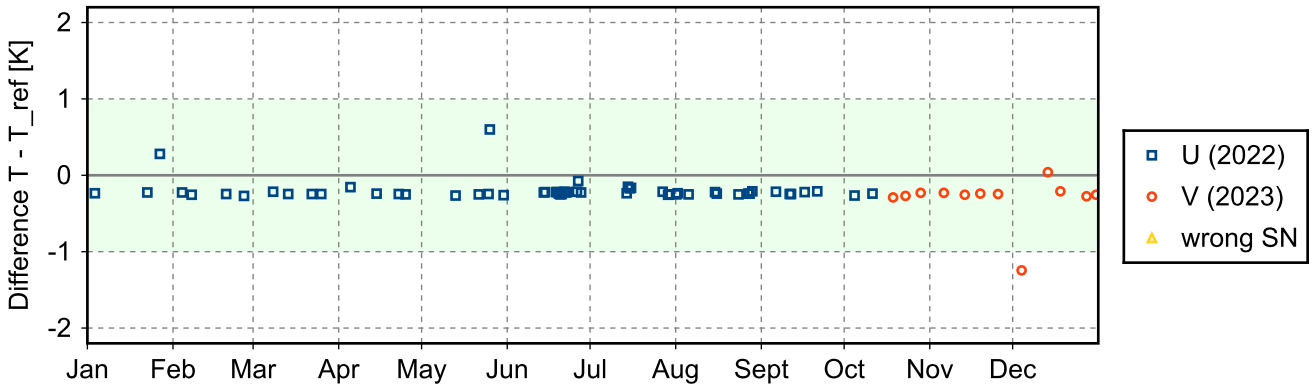
3.5 Instrument ground check

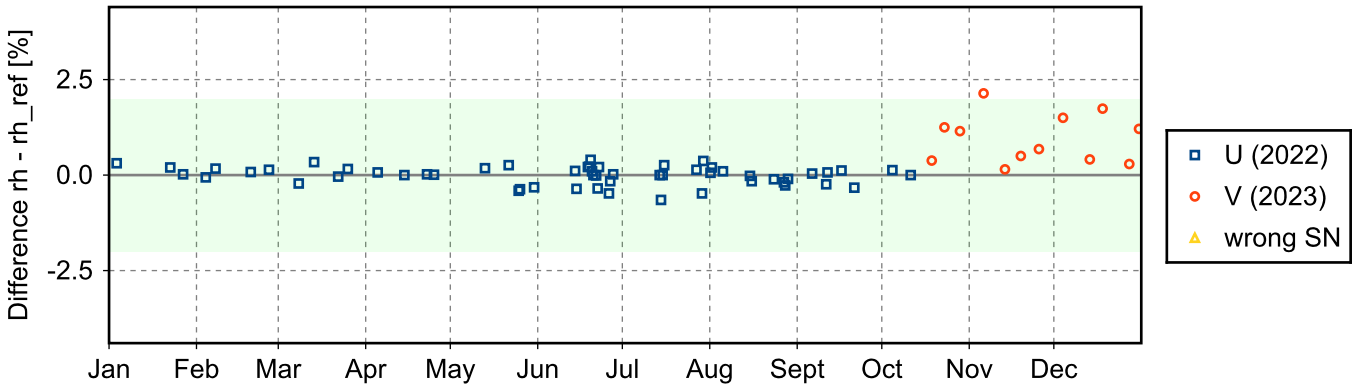
3.5.1 Stream: RS41

(1) GroundCheck: GC-RI41



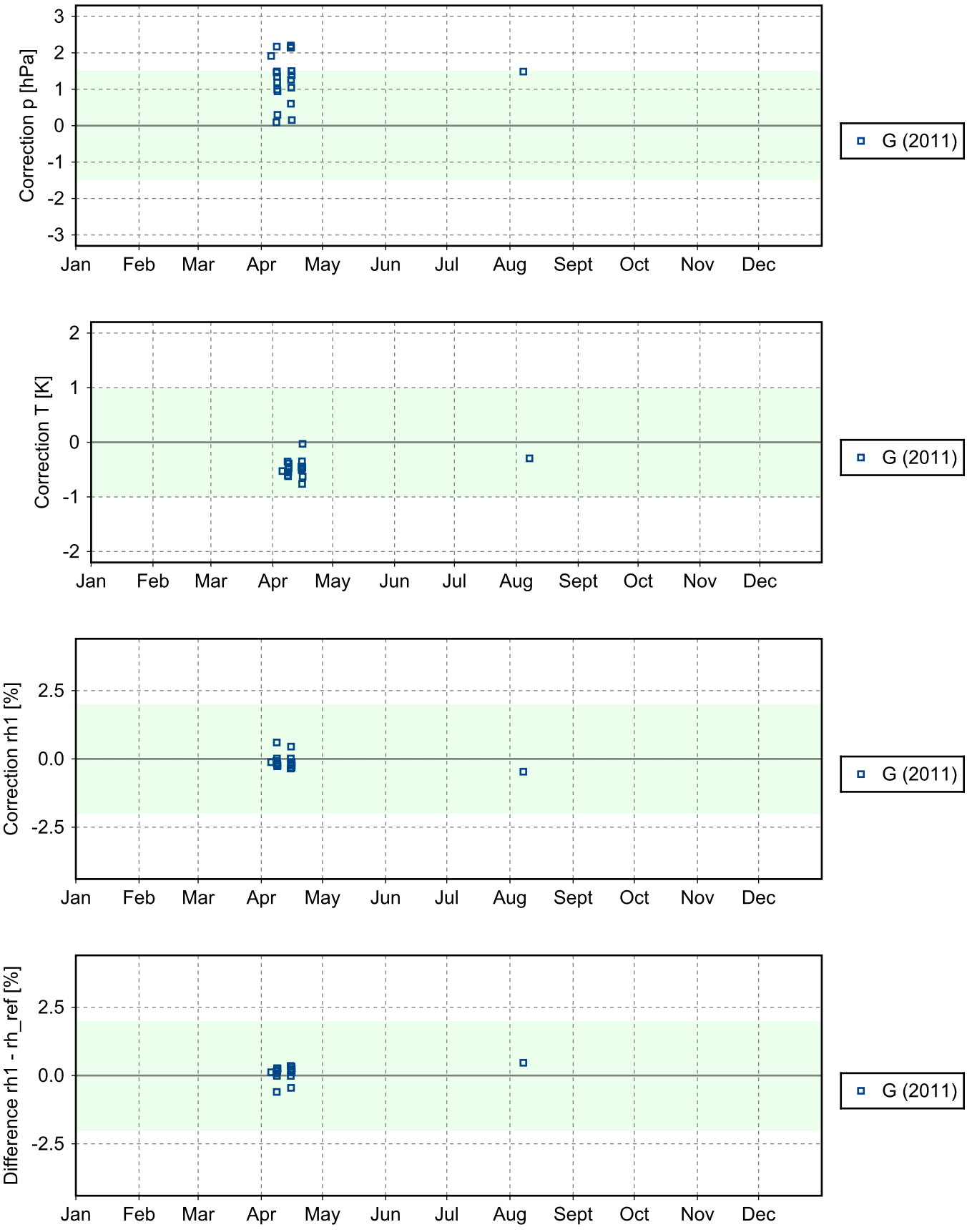
(2) GroundCheck: GC-SHC

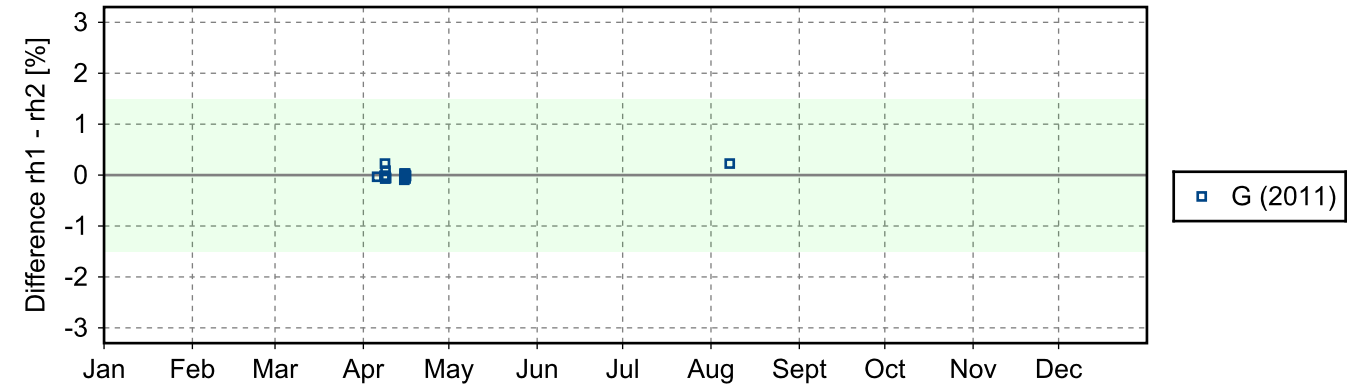




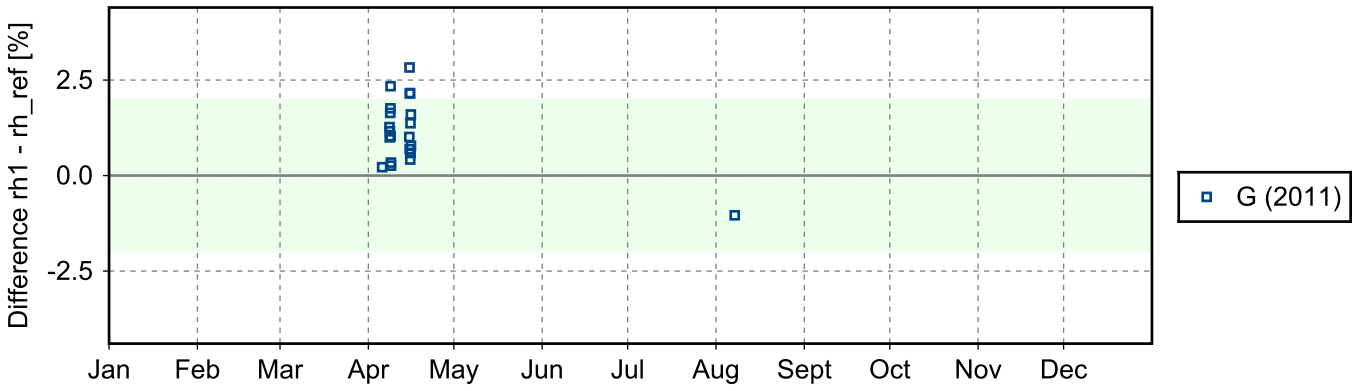
3.5.2 Stream: RS92

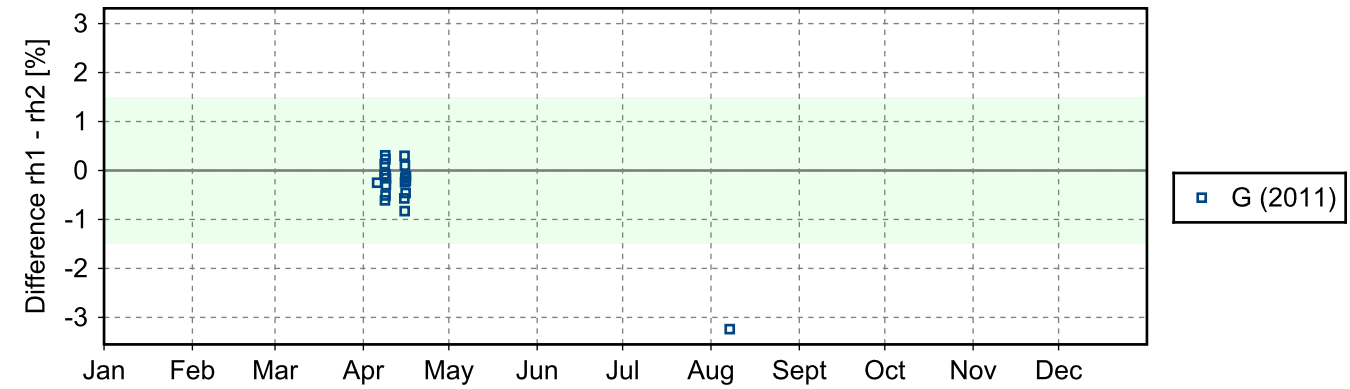
(1) GroundCheck: GC-GC25





(2) GroundCheck: GC-SHC





3.6 Measurement events