



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

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**14th GRUAN Implementation-
Coordination Meeting (ICM-14)**

Session 5

La Réunion

28 November - 02 December 2022

GRUAN Site Report for Lauder

(Submitted by Richard Querel)

Summary and Purpose of this Document

Report from the GRUAN site Lauder for the period January to December 2021.

Overview

The upper-air balloon programme at Lauder consisting of radiosondes, ozonesondes, and NOAA frost-point hygrometers (FPH), are all submitted to GRUAN. The GNSS receiver data are also submitted to GRUAN. Lauder hosts several NDACC and WOUDC submitting instruments that could be brought into GRUAN once formal products are defined. We are working with the Invercargill and McMurdo station GUAN sites and are submitting their radiosonde data to the LC for GRUAN processing.

Change and change management

No changes during 2021.

Resourcing

It is anticipated that our funding levels will remain stable over the next several years but are unlikely to increase.

Operations

- We have a stockpile of R23 cryogen for use at Lauder and to support a FPH viability campaign at Ross Island.
- SHC ground-checks are not performed on Internet radiosondes.

Covid-19

We had minimal impact from Covid-19.

Site assessment and certification

N/A

GRUAN-related research

Richard Querel is participating in the ASOPOS-2 expert panel that is reviewing ozonesonde standard operating procedures. RQ is working on the GRUAN ozonesonde data product, based on the best

practice prescribed in the ASOPOS 2.0 report

WG-GRUAN interface

Support letters from the Lead Centre are always helpful to demonstrate value to our management.

Other archiving centers

GAW, NDACC, WOUDC, BRSN, TCCON, CAMS

Participation in campaigns

SAGE3/ISS balloon launches during overpasses (ECC + FPH + POPS)

Future plans

A redevelopment of the Lauder stratospheric ozone lidar is underway. A new excimer laser has been installed and a new data acquisition system will be installed this coming year.



GRUAN Site Report for Lauder (LAU), 2021

Reported time range is Jan 2021 to Dec 2021

Created by the Lead Centre

Version from 2022-11-15

1 General GRUAN site information

Object	Value
Station name	Lauder
Unique GRUAN ID	LAU
Geographical position	-45.0500 °S, 169.6800 °E, 370.0 m
Operated by	NIWA National Institute of Water & Atmospheric Research
Main contact	Querel, Richard
WMO no./name	93817 LAUDER UPPER AIR
Operators	currently 5, changes +0 / -0
Sounding Site	2
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
LAU-GN-01	GNSS Site LDRZ	GNSS	1	operational
LAU-RS-01	Radiosonde Launch Site (Lauder)	Sounding Site	6	54
LAU-RS-02	Radiosonde Launch Site (Invercargill)	Sounding Site	1	729

1.2 General comments from Lead Centre

1.2.1 General

The GRUAN site Lauder is a distributed site with two places Lauder and Invercargill.

Operational data flow established in March 2014.

2 System: GNSS Site LDRZ (LAU-GN-01)

Object	Value
System name	GNSS Site LDRZ
Unique GRUAN ID	LAU-GN-01
System type	GNSS (GN - GNSS)
Geographical position	-45.0380 °S, 169.6840 °E, n m
Operated by	NIWA National Institute of Water & Atmospheric Research
Instrument contact	Querel, Richard
Started at	2012-05-01
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Measurements are recorded at station since May 2012.

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.

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

3 System: Radiosonde Launch Site (Lauder) (LAU-RS-01)

Object	Value
System name	Radiosonde Launch Site (Lauder)
Unique GRUAN ID	LAU-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	-45.0500 °S, 169.6800 °E, 370.0 m
Operated by	NIWA National Institute of Water & Atmospheric Research
Instrument contact	Querel, Richard
Started at	-
Defined setups	6 (OZONE, FPH-OZONE, RS-ONLY, RS41-ONLY, RESEARCH, OZONE-2)
Possible streams	ECC, FPH, IMET-1, RS41, RS92

3.1 Lead Centre comments

3.1.1 Dataflow

Ozone soundings are performed weekly. Research soundings using FPH, ECC, iMET-1, and Vaisala RS41 are performed approximately once per month.

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

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
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3.2.1 Stream: ECC

ECC		54	54	
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3.2.2 Stream: FPH

FPH		10	10	
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3.2.3 Stream: IMET-1

IMET-1		10	10	
IMET-1-RAW	001		10	

3.2.4 Stream: RS41

RS41		54	54	
RS41-RAW	001		54	
RS41-EDT	001		54	
RS41-GDP	001		53	
RS41-GDP-BETA	002		26	
RS41-GDP-BETA	003		42	

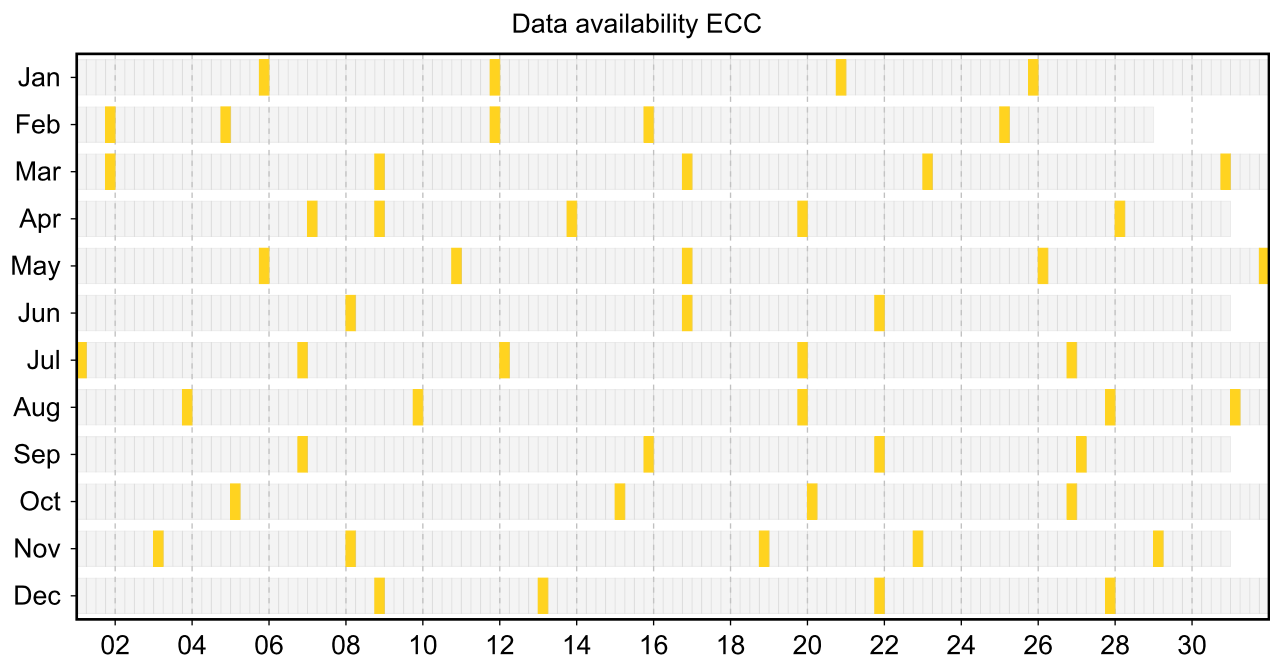
3.3 Availability of data products

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).

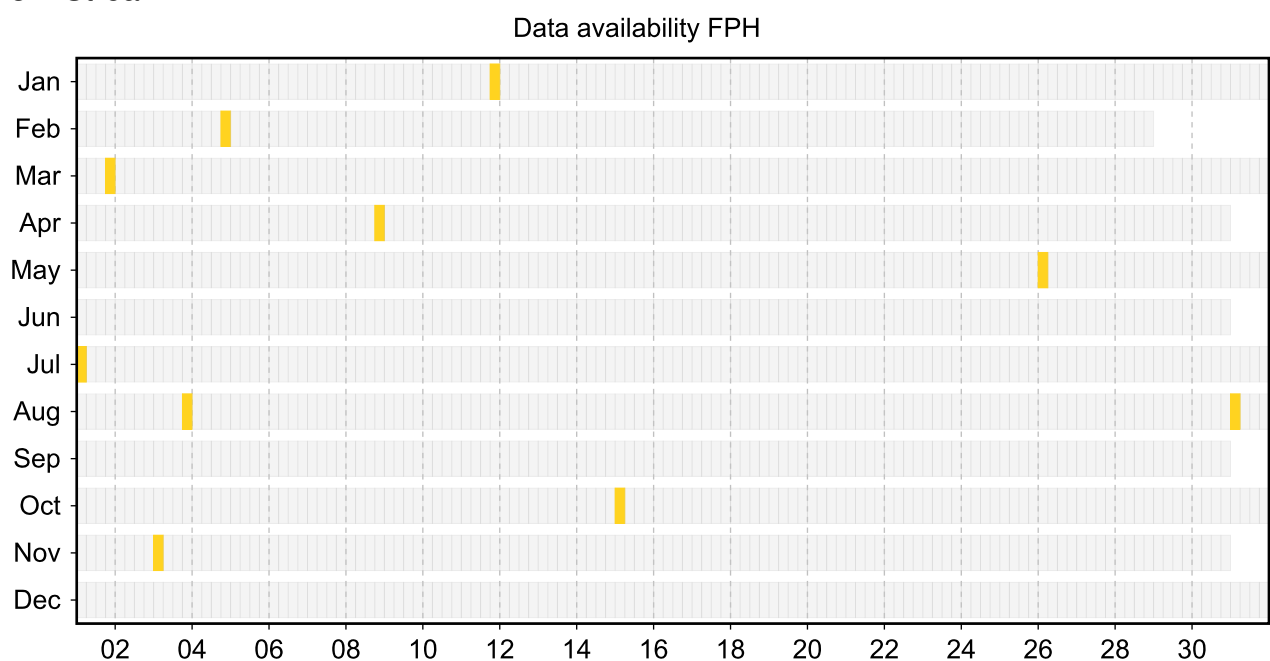
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

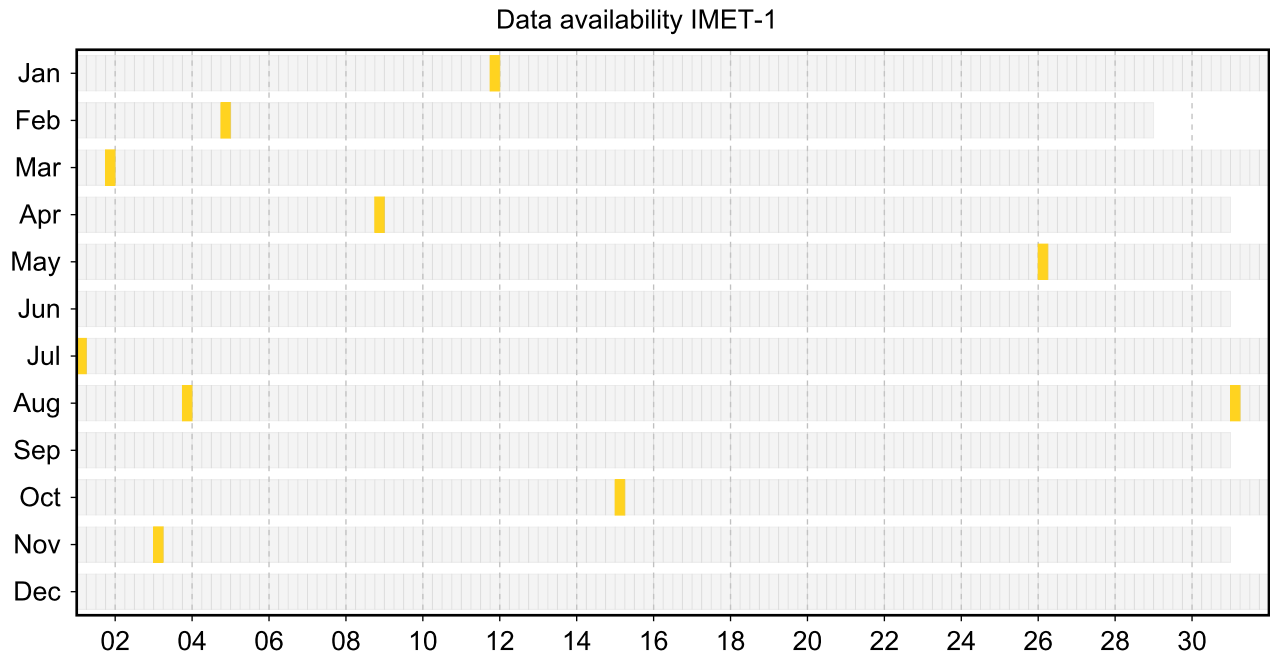
3.3.1 Stream: ECC



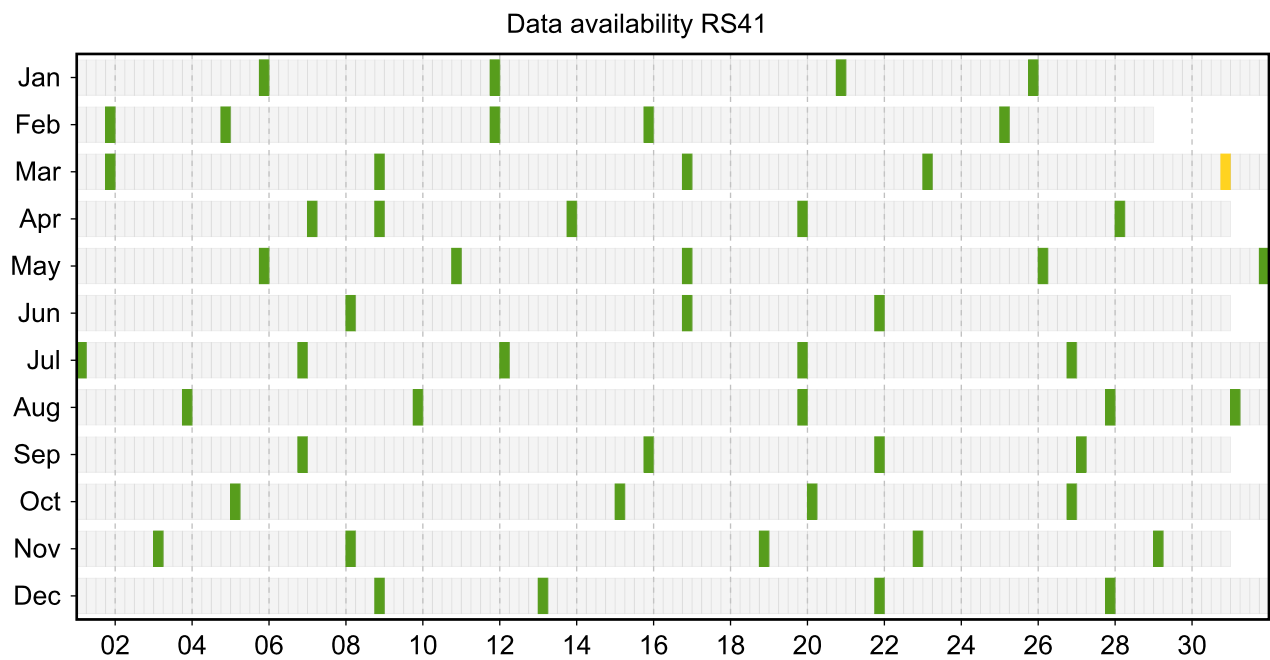
3.3.2 Stream: FPH



3.3.3 Stream: IMET-1



3.3.4 Stream: RS41



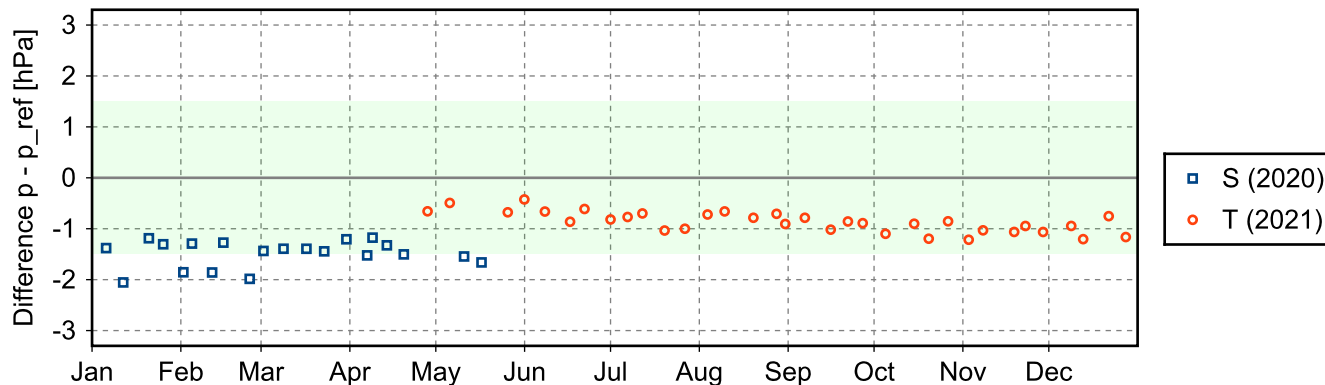
3.4 Instrument combinations of LAU-RS-01

Count	Instrument combination
10	ECC, FPH, IMET-1, RS41
44	ECC, RS41

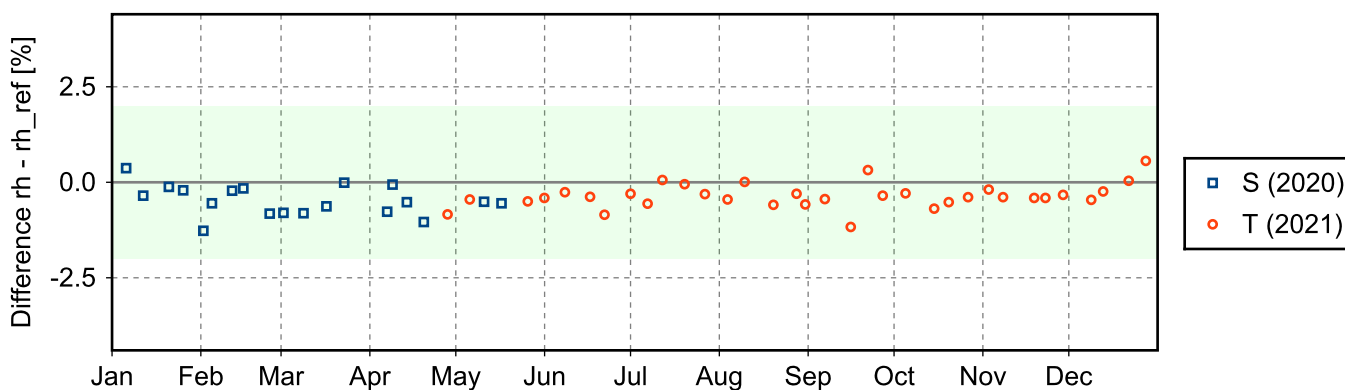
3.5 Instrument ground check

3.5.1 Stream: RS41

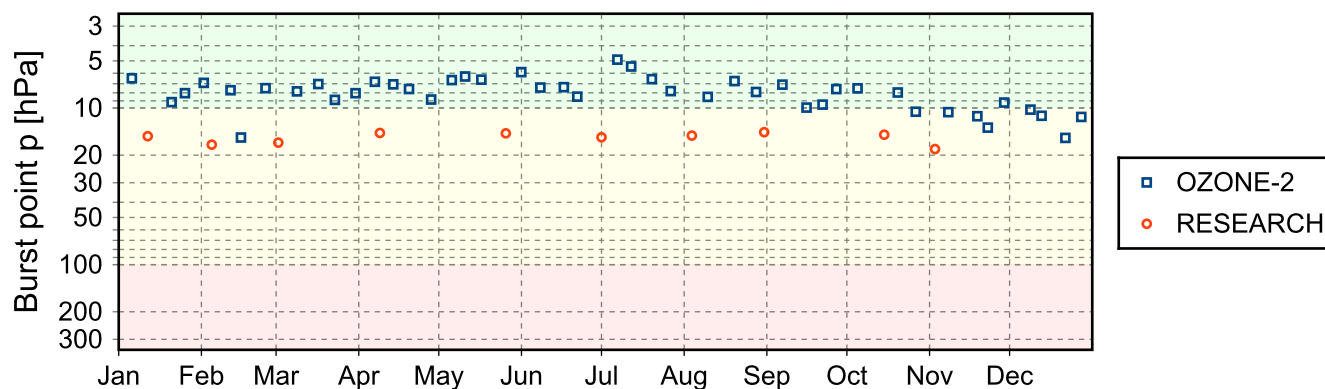
(1) GroundCheck: GC-RI41



(2) GroundCheck: GC-SHC



3.6 Measurement events



4 System: Radiosonde Launch Site (Invercargill) (LAU-RS-02)

Object	Value
System name	Radiosonde Launch Site (Invercargill)
Unique GRUAN ID	LAU-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	-46.4180 °S, 168.3305 °E, 2.0 m
Operated by	MET-SERVICE-NZ Meteorological Service of New Zealand Limited
Instrument contact	Querel, Richard
Started at	2016-07-01
Defined setups	1 (ROUTINE)
Possible streams	RS41

4.1 Lead Centre comments

4.1.1 Dataflow

Sonde dataflow of co-located site Invercargill to the GRUAN LC is operational since September 2016. This dataflow includes all twice daily operational soundings using the Vaisala RS41-SG.

4.1.2 General

Operational soundings using Vaisala RS41-SG are launched approximately twice daily since September 2016.

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		729	729	
RS41-RAW	001		729	
RS41-EDT	001		729	
RS41-GDP	001		729	
RS41-GDP-BETA	002		362	
RS41-GDP-BETA	003		528	

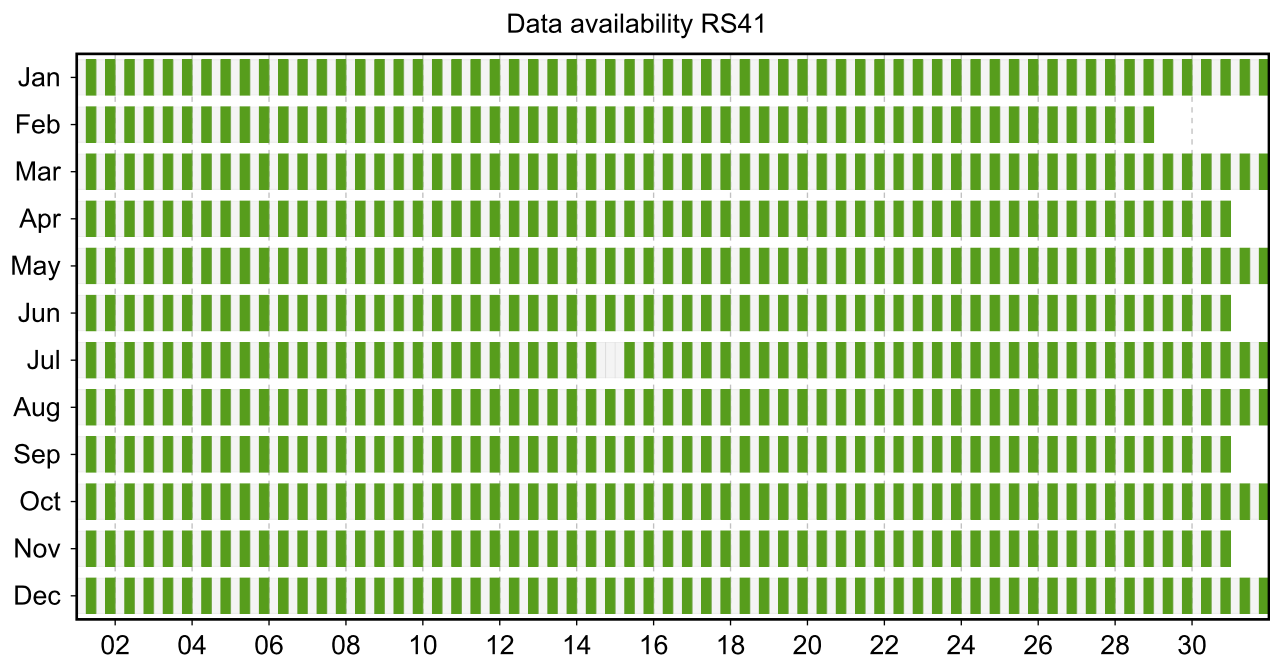
4.3 Availability of data products

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).

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.

4.3.1 Stream: RS41



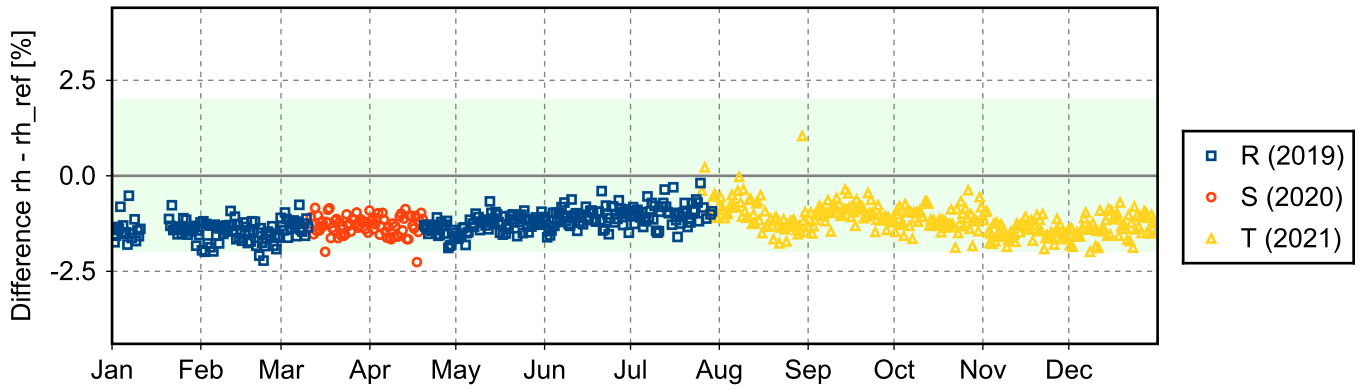
4.4 Instrument combinations of LAU-RS-02

Count	Instrument combination
729	RS41

4.5 Instrument ground check

4.5.1 Stream: RS41

(1) GroundCheck: GC-SHC



4.6 Measurement events

