



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

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**15th GRUAN Implementation-  
Coordination Meeting (ICM-15)**

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Session 5

Bern

11 March - 15 March 2024

## GRUAN Site Report for Payerne

*(Submitted by Giovanni Martucci)*

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

Report from the GRUAN site Payerne for the period January 2022 to December 2023.

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## Overview

*PAY-RS-01/02*: The Vaisala RS41 is the official operational sonde at Payerne. It is launched twice daily at 11 and 23 UTC. Automatic flights from the AS15 Autosonde system are launched every midnight, weekend (noon and midnight) and official holidays (noon and midnight). An operator launches manual flights every working day at noon or (independently of the time of launch) in combination with an ozone sonde (three times per week). In 2022 and 2023, 263 and 257 manual flights and 480 and 499 automatic flights, respectively, have been performed and the data been sent to the LC.

*PAY-GN-01*: To the best of our knowledge (MeteoSwiss), the Payerne GNSS data (Zenith Delay) are regularly streamed by SwissTopo to the GFZ at Potsdam in daily 5-minute resolution RINEX files. Along with the Zenith Delay files, the meteorological data from the SwissMetNet station of Payerne is sent to GFZ on RINEX-M format on a daily basis. The GFZ puts the Zenith Delay data obtained from SwissTopo on an ftp server `ftp://ftp.gfz-potsdam.de/GNSS/products/nrttrop/sinex_trop_GRUAN_EPOS8/wnnnn`. The data flow includes then all necessary data in order to perform an operational processing of GNSS-PW-GDP (as per communication of Galina Dick, on 27.06.2022).

*While we control entirely the transfer of meteorological RINEX-M daily files, we do not have any control of the Zenith Delay products that should be transferred by SwissTopo to the GFZ. We ask the LC and GFZ to clarify which piece of data are missing.*

*PAY-LI-01*: The PAY-LI-01 is an operational measurement program generating 30-minute water vapour, temperature and aerosol backscatter coefficient profiles obtained by inversion of the 1-minute Raman lidar RALMO raw profiles. During the years 2022 and 2023 a total of 308 and 288 daily measurements, respectively, have been performed by RALMO, which corresponds to the 84% and 79% of yearly data availability. On the 8<sup>th</sup> of October 2023, the automatic dataflow of the RALMO data to GRUAN LC has started.

*Contrary to what indicated in the “gsr\_PAY\_2023” report, the number of streamed daily data files is 68, not 84. We think the confusion comes from the way the data availability is calculated, which is also confirmed by the graphic 3.3.1 Stream LIDAR where only the data on the 28.11.2023 appear to be missing. The correct way to calculate the data availability for PAY-LI-01 must count the data into each streamed folder and if the folders are empty or only the log-files are present then the availability for that day must be zero. In fact, a daily folder is always created (and streamed to the LC) even if no data are inside, but only the logfiles.*

Currently, no official automatic procedure is in place at GRUAN LC to ingest automatically the temperature, temperature and aerosol data from RALMO and to generate a GDP. As a future step (summer 2024), Thierry Leblanc from JPL will set up GLASS to create the LIDAR GDP based on RALMO data.

## Change and change management

No changes of the operational PAY-RS-01/02 during the reporting period.

No changes of the operational PAY-GN-01 during the reporting period.

The PAY-LI-01 has undergone minor data interruption to allow the testing of a new depolarization channel, that will be operational in 2024.

## Resourcing

Resourcing challenges:

- No changes in the staff composition during the reporting period of 2022-23.
- Instrumentation and staff units have not undergone any cut during 2022-23.

Funding:

The funding are of governmental origin and stable.

## Operations

The performance targets of PAY-RS-01/02 for the data availability at the levels 100-30-10 hPa in 2022-23 have been met. The timeseries of burst altitudes for the period 2022-23 is provided in the plot below. The reasons of the early burst altitude occurrences are assessed by a multi-factor analysis that includes balloon inflation flow rate, balloon type and Vaisala valve. More general monthly statistics from EUCOS and MeteoSwiss (MIS) are provided below.

### *2022 MIS/EUCOS*

The sonde has reached 100 hPa = 100%

The sonde has reached 30 hPa = 98%

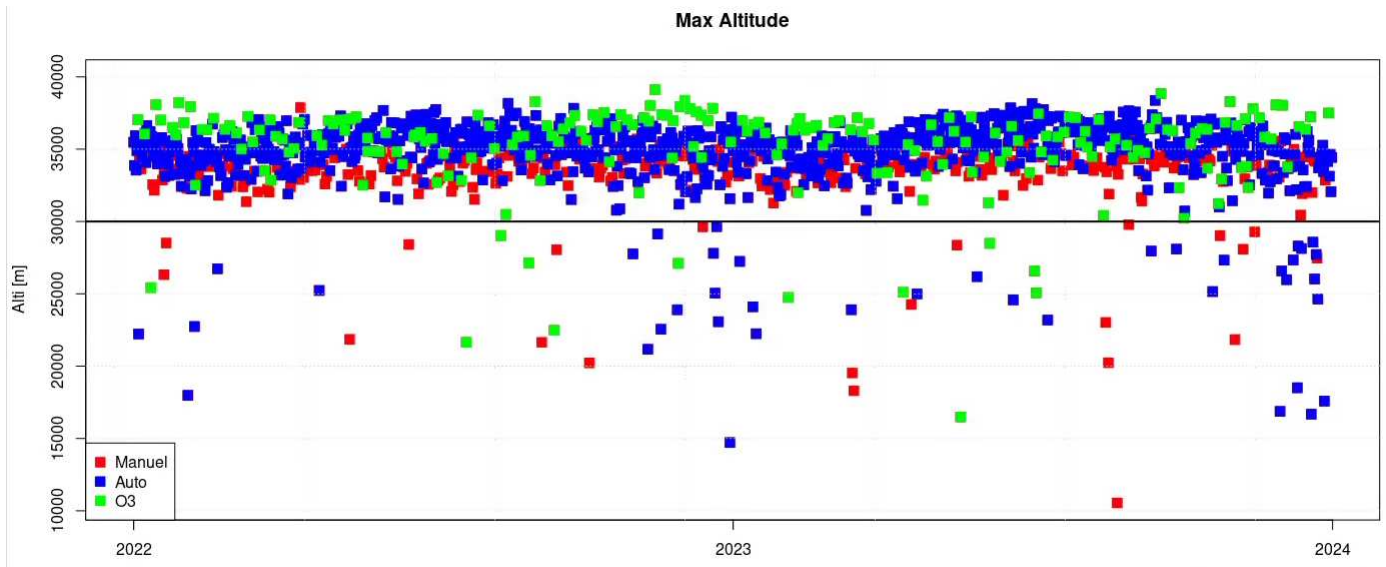
The sonde has reached 10 hPa = 96%

### *2023 MIS/EUCOS*

The sonde has reached 100 hPa = 100%

The sonde has reached 30 hPa = 98%

The sonde has reached 10 hPa = 94%



## Covid-19

- COVID-19 pandemic has not affected the overall quality or data availability of operational *PAY-RS-01/02* GRUAN measurements at Payerne over the reporting period.
- COVID-19 pandemic has not affected the overall quality or data availability of operational *PAY-GN-01* GRUAN measurements at Payerne over the reporting period.
- COVID-19 pandemic has not affected the overall quality or data availability of operational *PAY-LI-01* measurements at Payerne over the reporting period.

## Site assessment and certification

Payerne has submitted the filled re-certification site audit questionnaire in August 2023. We wait for the LC recommendation.

## GRUAN-related research

### Task Team participation over 2022-2023:

- Gonzague Romanens and Frédéric Vogt, MeteoSwiss, are members of the GRUAN *TT Radiosondes*.

- Giovanni Martucci is member of the GRUAN *TT Ancillary* under the specific task of LIDAR activities.
- A. Haefele, G. Martucci, G. Romanens, F. Vogt and C. Felix are part of the WMO task team on Upper Air Instrument Intercomparison.

In the framework of the UAI2022 and GRUAN activities, MeteoSwiss has performed 11 multi-payload flights: 7 flights with 2 Vaisala RS41 and 2 M10 on the same rig, and 4 flights with 1 RS41 and 2 M10 on the same rig. All flights have been processed by the LC and the IPSL to generate the GDP for the RS41 and the Modem M10, respectively.

<b>Date of flight</b>	<b>Payload</b>
19.01.2022	RS41 + RS41 + M10 + M10
20.01.2022	RS41 + RS41 + M10 + M10
12.04.2022	RS41 + RS41 + M10 + M10
05.05.2022	RS41 + RS41 + M10 + M10
12.05.2022	RS41 + RS41 + M10 + M10
23.05.2022	RS41 + RS41 + M10 + M10
25.01.2023	RS41 + RS41 + M10 + M10
25.01.2023	RS41 + M10 + M10
09.02.2023	RS41 + M10 + M10
15.02.2023	RS41 + M10 + M10
16.02.2023	RS41 + M10 + M10

MeteoSwiss PAY also continues the COBALD programme initiated in 2020. The nighttime COBALD flights have restarted in March 2022 and counted 9 flights in 2022 and 8 flights in 2023.

<b>Date of flight</b>	<b>Payload</b>
25.03.2022	GRUAN RS41 + COBALD
12.05.2022	GRUAN RS41 + COBALD
10.06.2022	GRUAN RS41 + COBALD
15.07.2022	GRUAN RS41 + COBALD
14.09.2022	GRUAN RS41 + COBALD
24.11.2022	GRUAN RS41 + COBALD
07.12.2022	GRUAN RS41 + COBALD
12.07.2022	GRUAN RS41 + COBALD
12.12.2022	GRUAN RS41 + COBALD
08.02.2023	GRUAN RS41 + COBALD
08.02.2023	GRUAN RS41 + COBALD
04.04.2023	GRUAN RS41 + COBALD
25.05.2023	GRUAN RS41 + COBALD
05.07.2023	GRUAN RS41 + COBALD
16.10.2023	GRUAN RS41 + COBALD
08.11.2023	GRUAN RS41 + COBALD

**GCOS Swiss H2O-Hub:** the H2O-Hub measurement campaigns in Payerne, has been conducted

during August-September 2023 for a total of 8 scientific flights. The goal of the project is to derive humidity profiles from ground to space by combining two balloon-borne instruments PCFH and ALBATROSS and the Vaisala RS41 radiosondes and the Raman LIDAR RALMO.

### **GRUAN-related publications:**

- WMO 2022 Upper-Air Instrument Intercomparison Campaign Final report, December 2023. Instruments and Observing Methods Report No. 143. Ruud Dirksen, Alexander Haefele, Frédéric P.A. Vogt, Michael Sommer, Christoph von Rohden, Giovanni Martucci, Gonzague Romanens, Christian Felix, Luca Modolo, Holger Vömel, Tzvetan Simeonov, Peter Oelsner, David Edwards, Tim Oakley, Tom Gardiner, Mohd. Imran Ansari
- Ghazal Farhani, Giovanni Martucci; Tyler Roberts; Alexander Haefele; Robert J. Sica, A Bayesian Neural Network Approach for Tropospheric Temperature Retrievals from a Lidar Instrument, accepted for publication in International Journal of Remote Sensing, 2023
- Chouza, F., Leblanc, T., Brewer, M., Wang, P., Martucci, G., Haefele, A., Vérémes, H., Duflot, V., Payen, G., and Keckhut, P.: The impact of aerosol fluorescence on long-term water vapor monitoring by Raman lidar and evaluation of a potential correction method, *Atmos. Meas. Tech.*, 15, 42414256, <https://doi.org/10.5194/amt-15-4241-2022>, 2022.
- Witali Krochin, Francisco Navas-Guzmán, David Kuhl, Axel Murk, and Gunter Stober: Continuous temperature sounding at the stratosphere and lower mesosphere with a ground-based radiometer considering the Zeeman effect, *Atmos. Meas. Tech.*, 15, 22312249, <https://doi.org/10.5194/amt-15-2231-2022>, 2022.

## **WG-GRUAN interface**

No request

## **Other archiving centers**

NDACC

## **Participation in campaigns**

**GCOS Swiss H2O-Hub:** The H2O-Hub measurement campaigns in Payerne, has been conducted during August-September 2023 for a total of 8 scientific flights. The goal of the project us to derive humidity profiles from ground to space by combining two balloon-borne instruments PCFH and ALBATROSS and the Vaisala RS41 radiosondes and the Raman LIDAR RALMO.

## **Future plans**

- Second phase of GCOS Swiss H2O-Hub (May-August 2024)
- MPLNET - RALMO intercomparison with EarthCARE validation. TBD 2024





# GRUAN Site Report for Payerne (PAY), 2022

Reported time range is Jan 2022 to Dec 2022

Created by the Lead Centre

Version from 2024-03-01

## 1 General GRUAN site information

Object	Value
Station name	Payerne
Unique GRUAN ID	PAY
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Main contact	Martucci, Giovanni
WMO no./name	06610 PAYERNE
Operators	currently 14, changes +0 / -0
Sounding Site	2
Lidar	1
GNSS	1

### 1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
PAY-GN-01	GNSS Site PAYE	GNSS	1	operational
PAY-LI-01	Payerne Raman WV Lidar (RALMO)	Lidar	1	0
PAY-RS-01	Payerne Radiosonde Launch Site	Sounding Site	8	263
PAY-RS-02	Automatic Payerne Launch System (Autosonde)	Sounding Site	1	480

### 1.2 General comments from Lead Centre

#### 1.2.1 Request

An improvement of GNSS dataflow is requested by involvement of site, processing centre at GFZ and GRUAN LC.

## 2 System: GNSS Site PAYE (PAY-GN-01)

<b>Object</b>	<b>Value</b>
System name	GNSS Site PAYE
Unique GRUAN ID	PAY-GN-01
System type	GNSS (GN - GNSS)
Geographical position	46.8121 °N, 6.9439 °E, 548.7 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
Started at	-
Defined setups	1 (HOURLY)
Possible streams	-

### 2.1 Lead Centre comments

#### 2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC in October 2018. The current dataflow only includes converted meteorological data (RINEX).

### 3 System: Payerne Raman WV Lidar (RALMO) (PAY-LI-01)

<b>Object</b>	<b>Value</b>
System name	Payerne Raman WV Lidar (RALMO)
Unique GRUAN ID	PAY-LI-01
System type	Lidar (LI - Lidar)
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
Started at	2013-09-01
Defined setups	1 (DEFAULT)
Possible streams	LIDAR

#### 3.1 Lead Centre comments

No comments from Lead Centre.

## 4 System: Payerne Radiosonde Launch Site (PAY-RS-01)

Object	Value
System name	Payerne Radiosonde Launch Site
Unique GRUAN ID	PAY-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	-
Defined setups	8 (ROUTINE, OZONE, RESEARCH, SRS-TEST, DUAL, ROUTINE2, ROUTINE3, OZONE2)
Possible streams	COBALD, ECC, FLASH, M10, RS41, RS92, SRS-C34, SRS-C50

### 4.1 Lead Centre comments

#### 4.1.1 Dataflow

Dataflow to GRUAN LC was running intermittently since September 2011.

Currently, the dataflow includes streams of the operational sonde Vaisala RS41-SG, Modem M10, COBALD backscatter sonde, and ECC ozone sonde. Launches are promptly recorded using the GruanToolRsLaunch (gtRsl) or the RsLaunchClient (RLC).

#### 4.1.2 Data quality

A step-like change in SHC RH ground check results within the same RS batch towards larger deviations in the first half of August 2022 is noticeable.

#### 4.1.3 General

This is the manual launching site.

There is very good performance in terms of burst altitude which is regularly 10 hPa to 5 hPa and higher.

## 4.2 GRUAN data products

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

COBALD		8	8	
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### 4.2.2 Stream: ECC

ECC		154	154	
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### 4.2.3 Stream: M10

M10		12	12	
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### 4.2.4 Stream: RS41

RS41		269	269	
RS41-RAW	001		268	
RS41-EDT	001		268	
RS41-GDP	001		266	

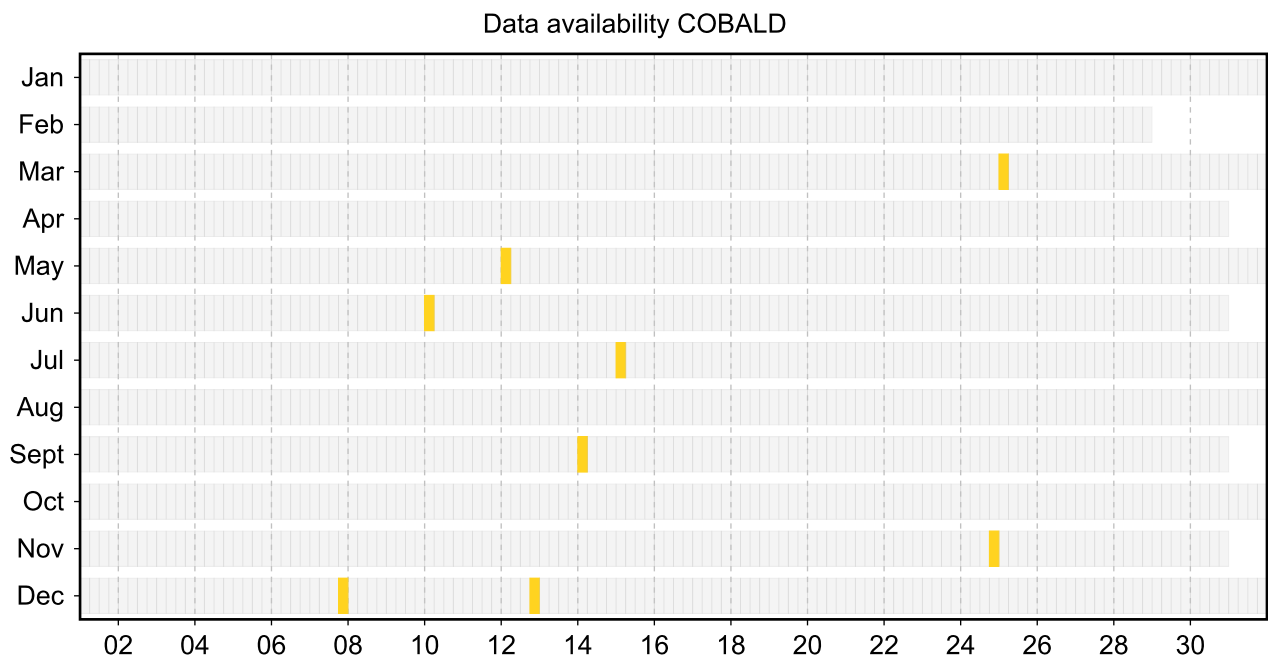
### 4.3 Availability of data products

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).

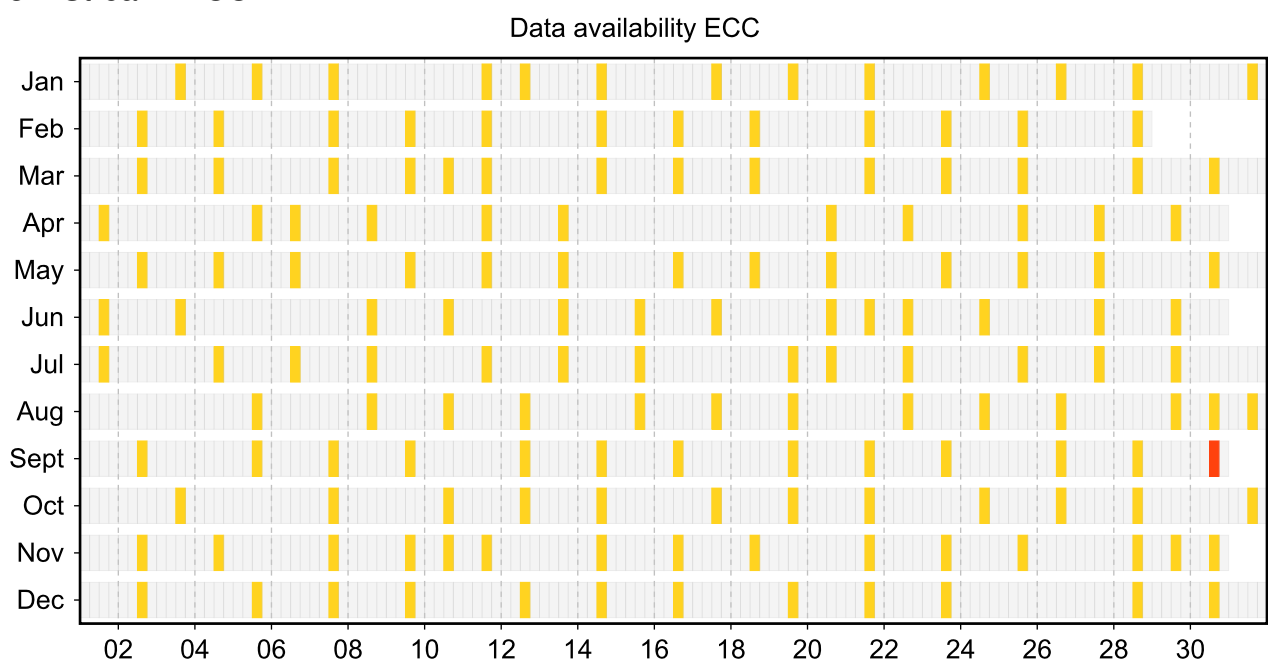
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

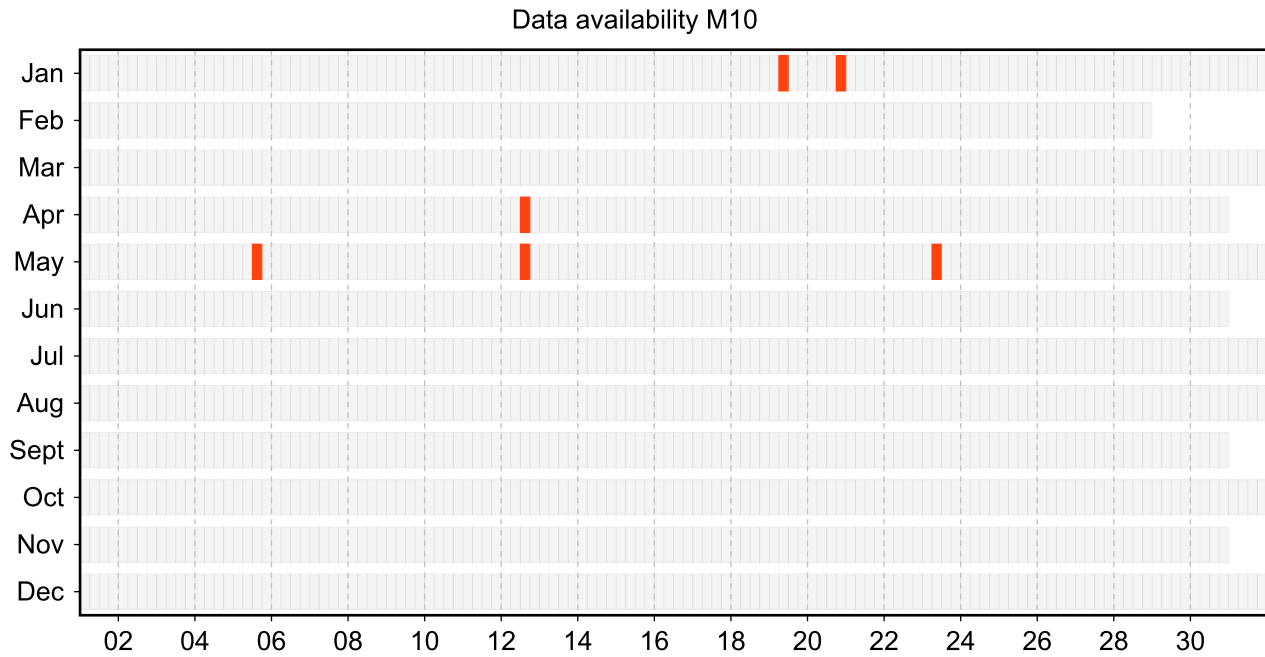
#### 4.3.1 Stream: COBALD



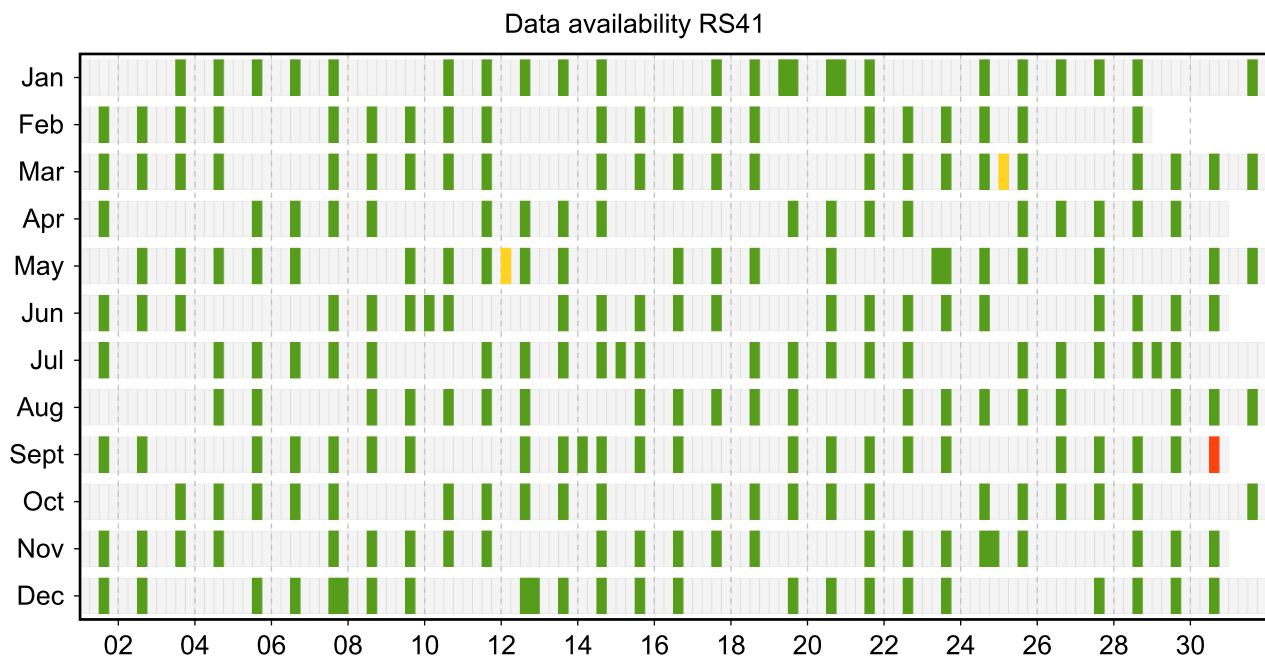
#### 4.3.2 Stream: ECC



### 4.3.3 Stream: M10



### 4.3.4 Stream: RS41



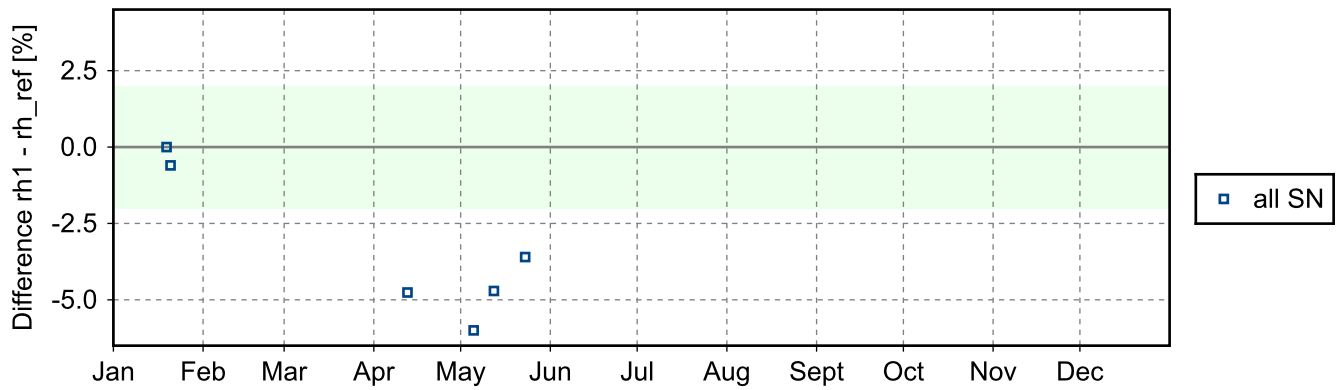
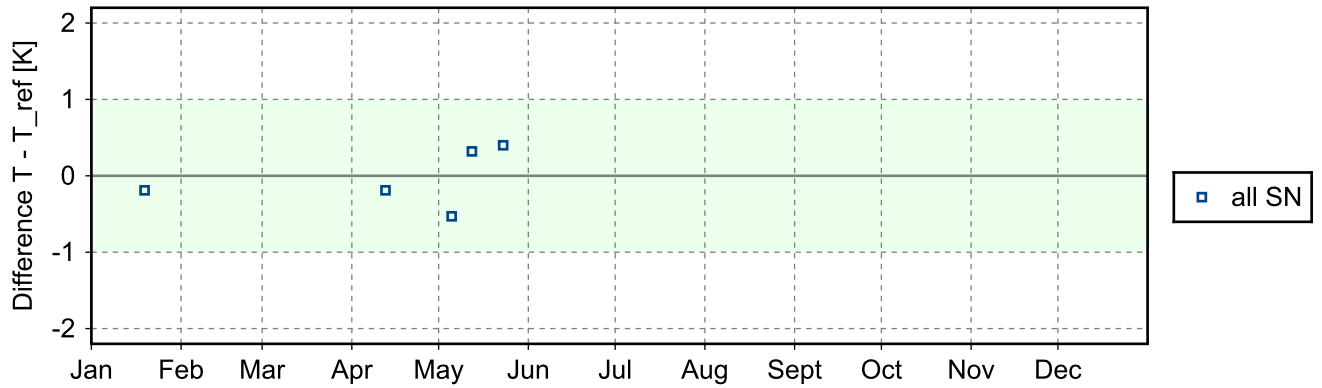
## 4.4 Instrument combinations of PAY-RS-01

Count	Instrument combination
8	COBALD, RS41
154	ECC, RS41
6	2x M10, 2x RS41
95	RS41

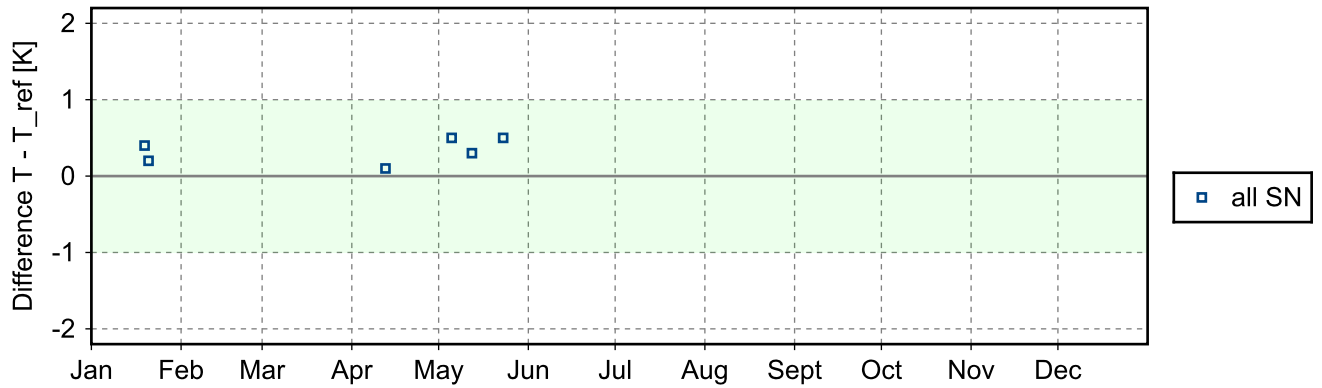
## 4.5 Instrument ground check

### 4.5.1 Stream: M10

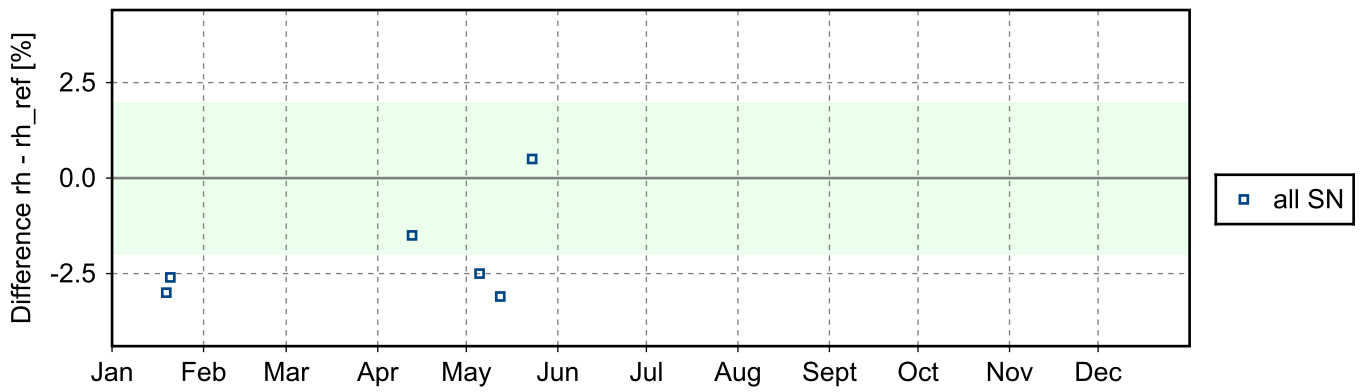
#### (1) GroundCheck: GC-SHC



#### (2) GroundCheck: GC-TU(room)

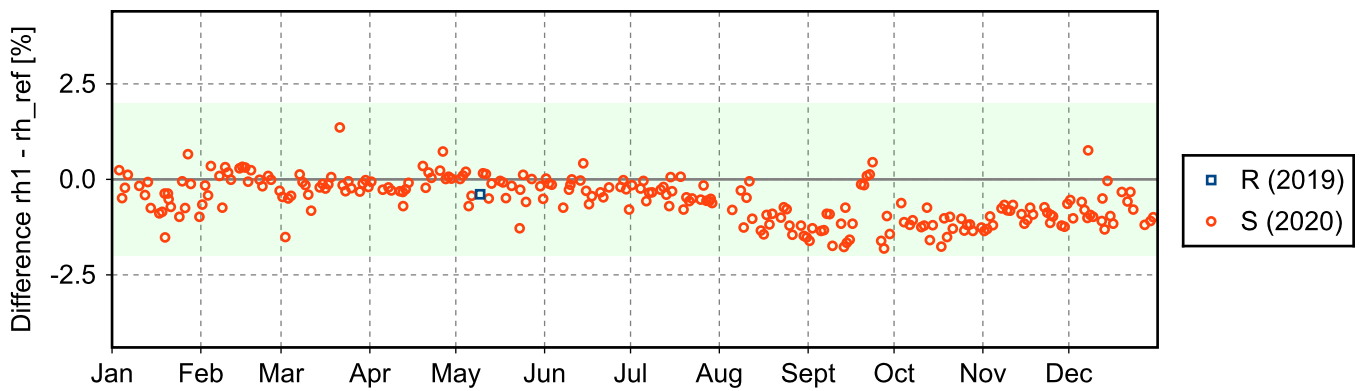
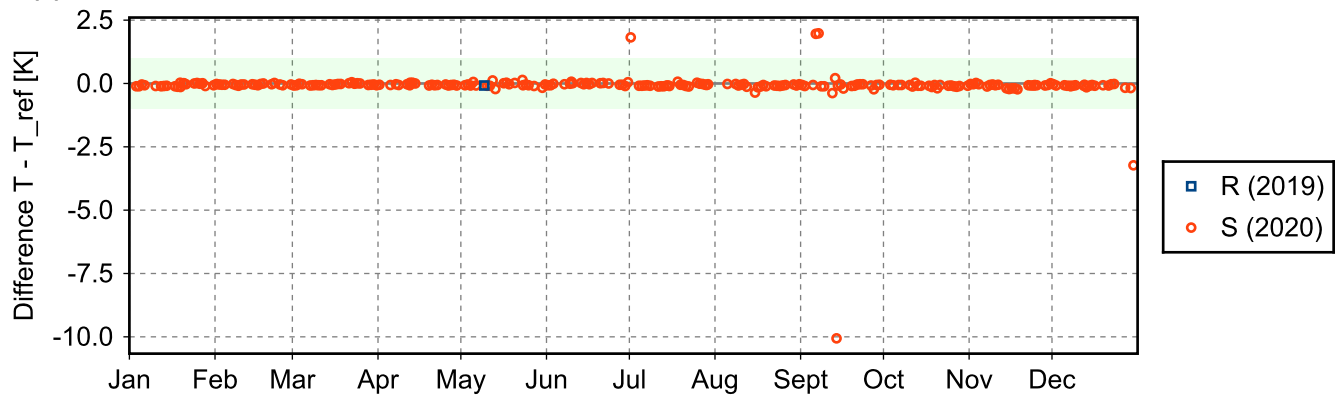




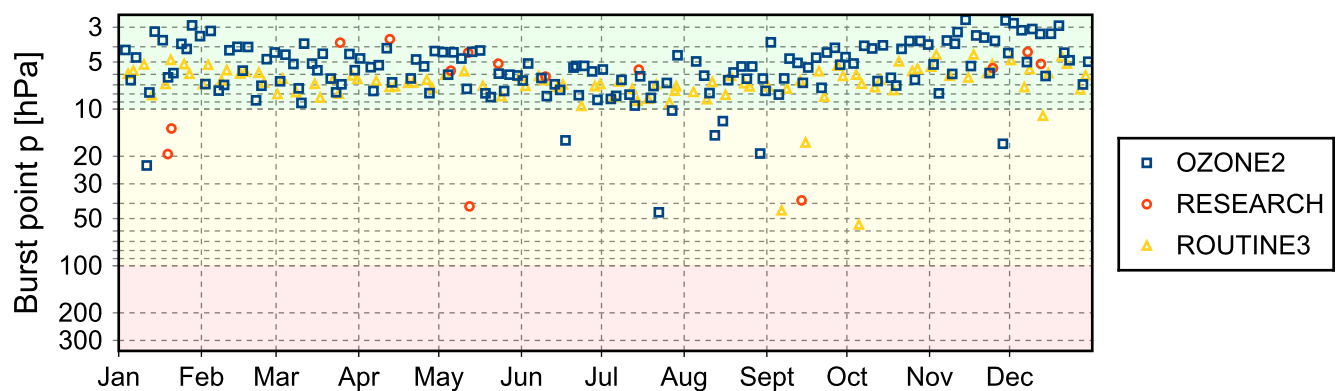


4.5.2 Stream: RS41

(1) GroundCheck: GC-SHC



4.6 Measurement events



## 5 System: Automatic Payerne Launch System (Autosonde) (PAY-RS-02)

Object	Value
System name	Automatic Payerne Launch System (Autosonde)
Unique GRUAN ID	PAY-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 490.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	2018-03-19
Defined setups	1 (AUTO1)
Possible streams	RS41

### 5.1 Lead Centre comments

#### 5.1.1 Dataflow

Dataflow of auto launcher system to GRUAN LC is running since October 2018. This dataflow includes stream of the operational sonde Vaisala RS41-SG (since March 2018). All launches are promptly recorded using the GruanToolRsLaunch (gtRs).

#### 5.1.2 General

This is the autolauncher system.

There is very good performance in terms of burst altitude which is regularly 10 hPa to 5 hPa and higher.

### 5.2 GRUAN data products

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

RS41		480	480	
RS41-RAW	001		480	
RS41-EDT	001		480	
RS41-GDP	001		479	

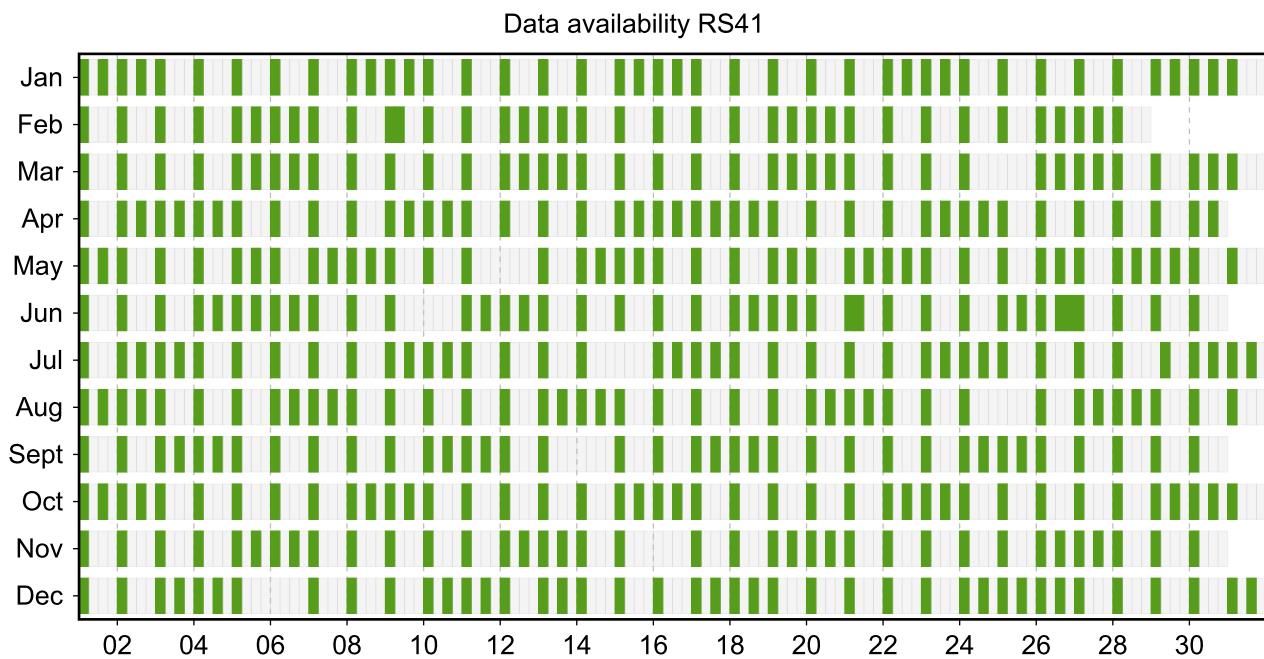
### 5.3 Availability of data products

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.

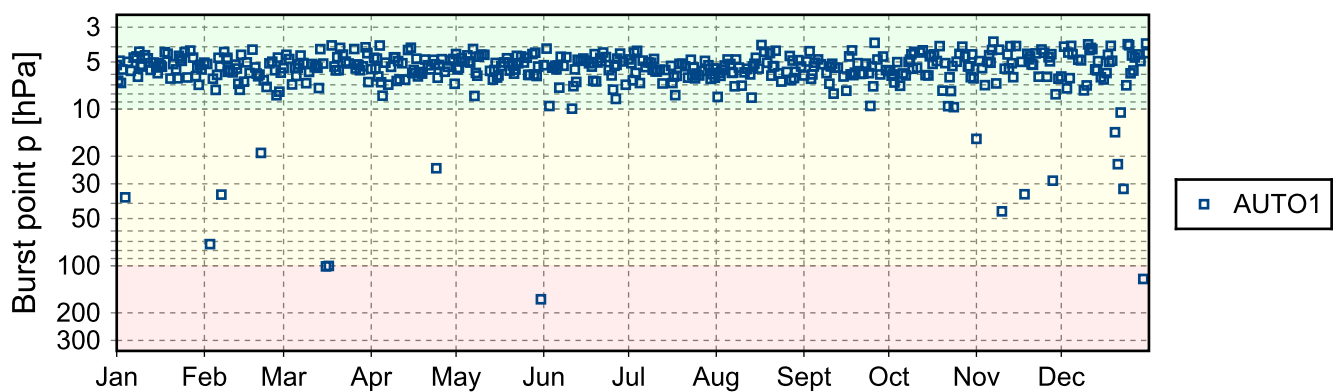
#### 5.3.1 Stream: RS41



#### 5.4 Instrument combinations of PAY-RS-02

Count	Instrument combination
480	RS41

#### 5.6 Measurement events





# GRUAN Site Report for Payerne (PAY), 2023

Reported time range is Jan 2023 to Dec 2023  
Created by the Lead Centre  
Version from 2024-03-01

## 1 General GRUAN site information

Object	Value
Station name	Payerne
Unique GRUAN ID	PAY
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Main contact	Martucci, Giovanni
WMO no./name	06610 PAYERNE
Operators	currently 14, changes +0 / -0
Sounding Site	2
Lidar	1
GNSS	1

### 1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
PAY-GN-01	GNSS Site PAYE	GNSS	1	operational
PAY-LI-01	Payerne Raman WV Lidar (RALMO)	Lidar	1	84
PAY-RS-01	Payerne Radiosonde Launch Site	Sounding Site	8	257
PAY-RS-02	Automatic Payerne Launch System (Autosonde)	Sounding Site	1	499

### 1.2 General comments from Lead Centre

#### 1.2.1 General

New dataflow of Lidar raw data was started in October 2023.

#### 1.2.2 Request

An improvement of GNSS dataflow is requested by involvement of site, processing centre at GFZ and GRUAN LC.

## 2 System: GNSS Site PAYE (PAY-GN-01)

<b>Object</b>	<b>Value</b>
System name	GNSS Site PAYE
Unique GRUAN ID	PAY-GN-01
System type	GNSS (GN - GNSS)
Geographical position	46.8121 °N, 6.9439 °E, 548.7 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
Started at	-
Defined setups	1 (HOURLY)
Possible streams	-

### 2.1 Lead Centre comments

#### 2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC in October 2018. The current dataflow only includes converted meteorological data (RINEX).

### 3 System: Payerne Raman WV Lidar (RALMO) (PAY-LI-01)

Object	Value
System name	Payerne Raman WV Lidar (RALMO)
Unique GRUAN ID	PAY-LI-01
System type	Lidar (LI - Lidar)
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
Started at	2013-09-01
Defined setups	1 (DEFAULT)
Possible streams	LIDAR

#### 3.1 Lead Centre comments

##### 3.1.1 Dataflow

The dataflow of Lidar data to GRUAN LC was started in October 2023.

#### 3.2 GRUAN data products

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

LIDAR		84	84	
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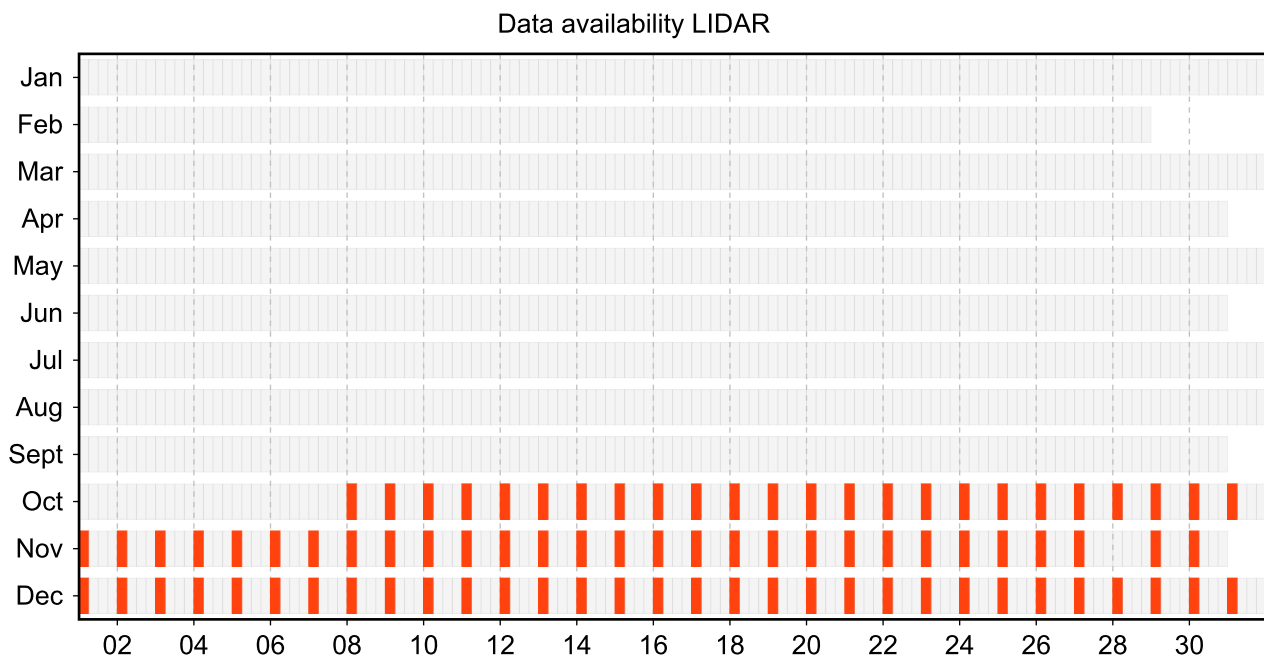
### 3.3 Availability of data products

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: LIDAR



#### 3.4 Instrument combinations of PAY-LI-01

Count	Instrument combination
84	LIDAR

## 4 System: Payerne Radiosonde Launch Site (PAY-RS-01)

Object	Value
System name	Payerne Radiosonde Launch Site
Unique GRUAN ID	PAY-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	-
Defined setups	8 (ROUTINE, OZONE, RESEARCH, SRS-TEST, DUAL, ROUTINE2, ROUTINE3, OZONE2)
Possible streams	COBALD, ECC, FLASH, M10, RS41, RS92, SRS-C34, SRS-C50

### 4.1 Lead Centre comments

#### 4.1.1 Dataflow

Dataflow to GRUAN LC was running intermittently since September 2011.

Currently, the dataflow includes streams of the operational sonde Vaisala RS41-SG, Modem M10, COBALD backscatter sonde, and ECC ozone sonde. Launches are promptly recorded using the GruanToolRsLaunch (gtRsl) or the RsLaunchClient (RLC).

#### 4.1.2 General

This is the manual launching site.

There is very good performance in terms of burst altitude which is regularly 10 hPa to 5 hPa and higher.

### 4.2 GRUAN data products

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

COBALD		7	7	
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#### 4.2.2 Stream: ECC

ECC		156	156	
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#### 4.2.3 Stream: RS41

RS41		257	257	
RS41-RAW	001		257	
RS41-EDT	001		257	
RS41-GDP	001		256	



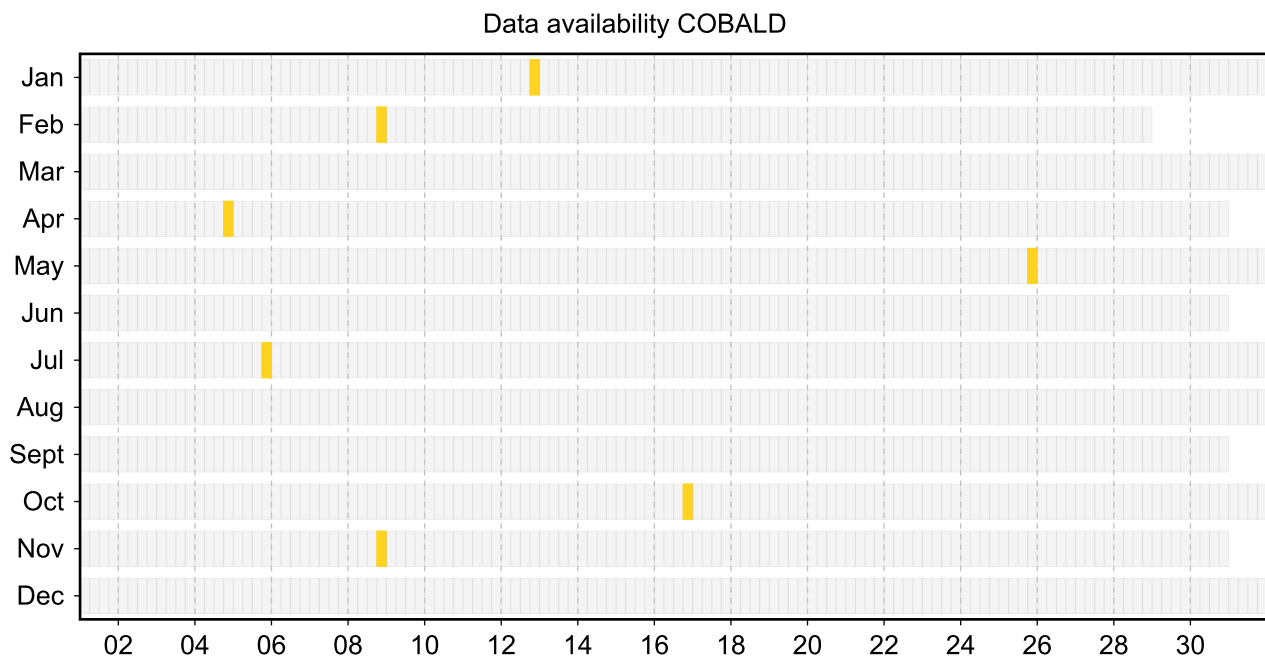
### 4.3 Availability of data products

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).

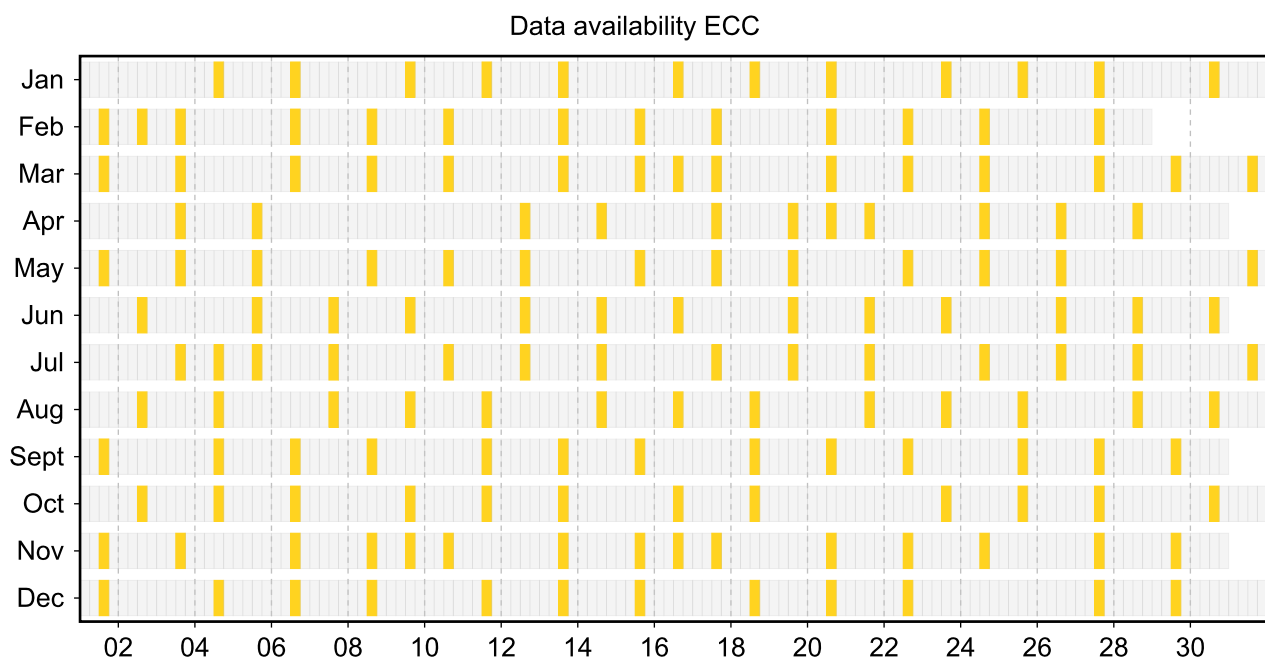
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

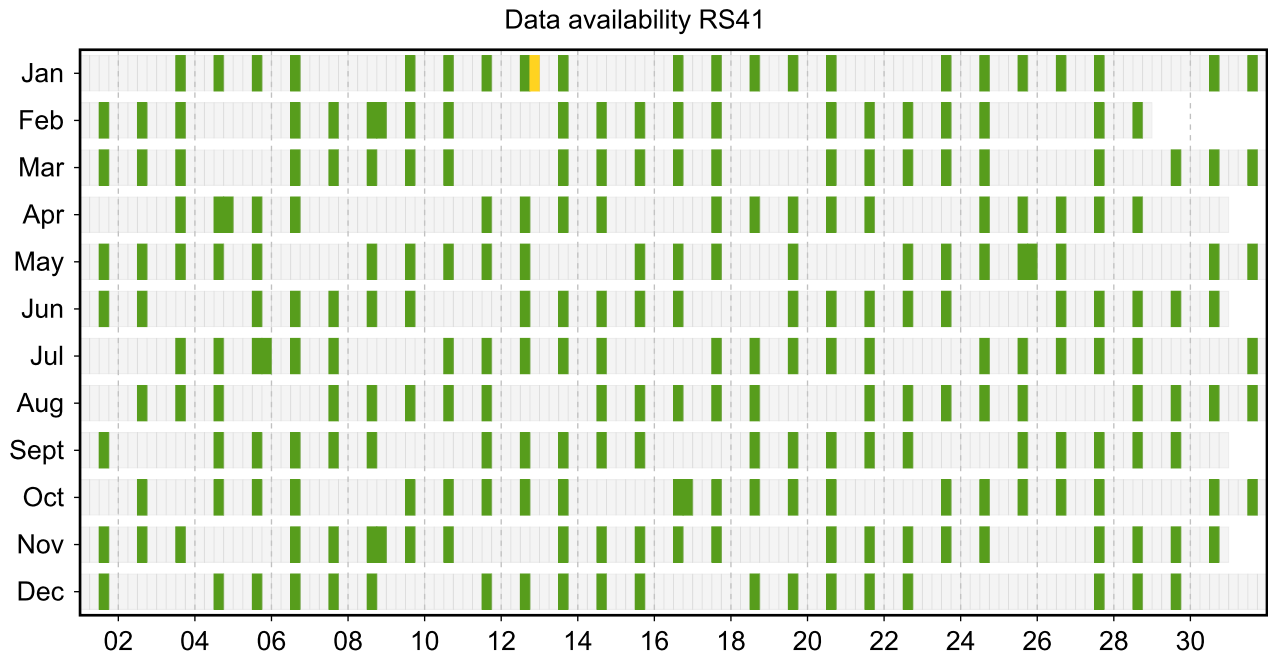
#### 4.3.1 Stream: COBALD



#### 4.3.2 Stream: ECC



4.3.3 Stream: RS41



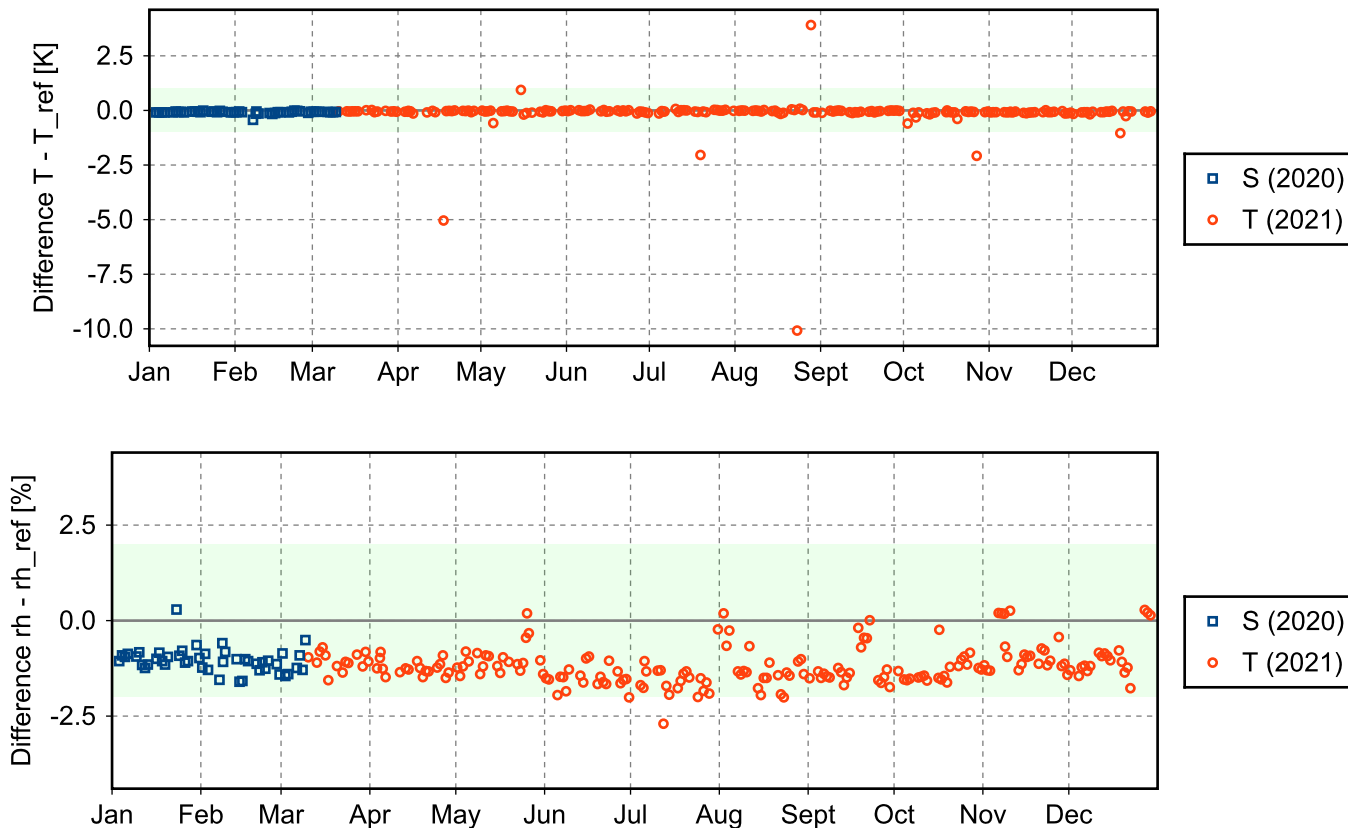
4.4 Instrument combinations of PAY-RS-01

Count	Instrument combination
7	COBALD, RS41
156	ECC, RS41
94	RS41

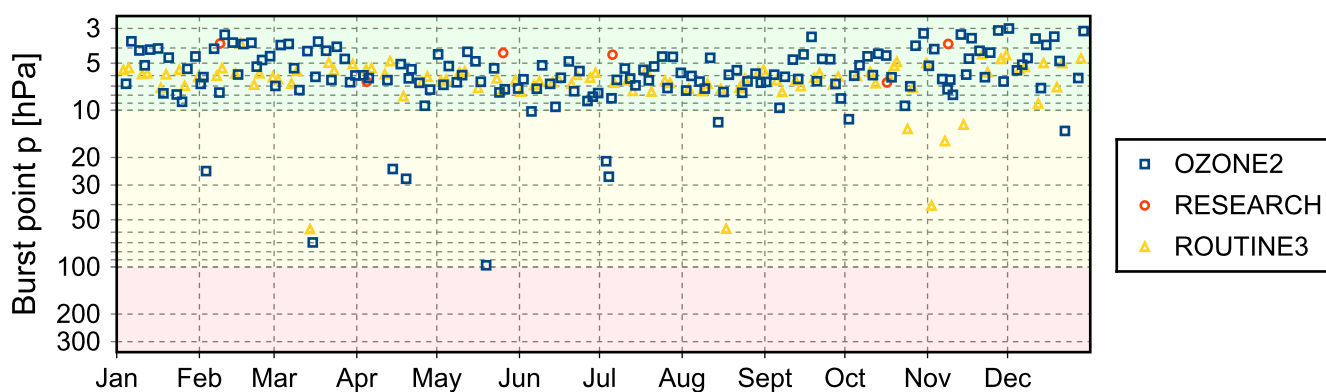
### 4.5 Instrument ground check

#### 4.5.1 Stream: RS41

##### (1) GroundCheck: GC-SHC



### 4.6 Measurement events



## 5 System: Automatic Payerne Launch System (Autosonde) (PAY-RS-02)

Object	Value
System name	Automatic Payerne Launch System (Autosonde)
Unique GRUAN ID	PAY-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 490.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	2018-03-19
Defined setups	1 (AUTO1)
Possible streams	RS41

### 5.1 Lead Centre comments

#### 5.1.1 Dataflow

Dataflow of auto launcher system to GRUAN LC is running since October 2018. This dataflow includes stream of the operational sonde Vaisala RS41-SG (since March 2018). All launches are promptly recorded using the GruanToolRsLaunch (gtRs).

#### 5.1.2 General

This is the autolauncher system.

There is very good performance in terms of burst altitude which is regularly 10 hPa to 5 hPa and higher.

### 5.2 GRUAN data products

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

RS41		499	499	
RS41-RAW	001		499	
RS41-EDT	001		499	
RS41-GDP	001		497	

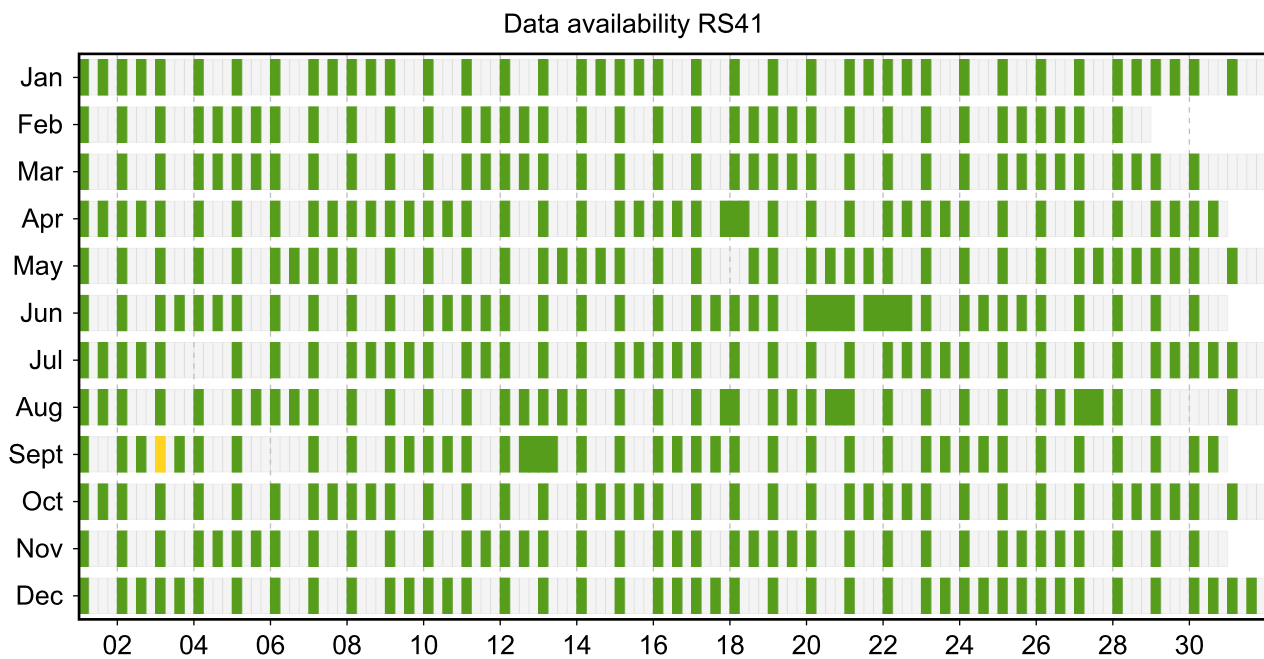
### 5.3 Availability of data products

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.

#### 5.3.1 Stream: RS41



#### 5.4 Instrument combinations of PAY-RS-02

Count	Instrument combination
499	RS41

#### 5.6 Measurement events

