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

15th GRUAN Implementation-Coordination Meeting (ICM-15)
Bern
11 March - 15 March 2024

Doc. 5.12
(06.II.2024)

Session 5

GRUAN Site Report for HongKong

(Submitted by LEUNG, Wai Hung)

Summary and Purpose of this Document

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

Overview

Hong Kong was accepted as a GRUAN candidate site in July 2020. In 2022 and 2023, Hong Kong continues to contribute to GRUAN with the operational data stream on Cryogenic Frost point Hygrometer (CFH) and ECC ozonesonde. All CFH and ECC ozone sonde launches were performed in accordance with GRUAN operational procedures, which means the application of a manufacturer-independent ground check of the RS41 radiosonde in a Standard Humidity Chamber (SHC) at 100% RH prior to launch. Data are submitted to the Lead Centre using the RsLaunchClient.

Change and change management

In mid 2023, data flow for routine radiosonde launches to GRUAN was being automated.

Resourcing

The situation at Hong Kong is positive, having stable financial and personnel resources to perform and sustain routine and scheduled launches.

Operations

In 2022 and 2023, the operations related to CFH and ozone sonde launches, as well as the related data submission to the Lead Centre were performed smoothly. The supply of R23 cryogen was stable. Manufacturer-independent ground checks of RS41 radiosondes were performed before loading into the autolauncher. Data flow for routine radiosonde launches were sent automatically to the lead centre.

Covid-19

In 2022 and 2023, the operations related to GRUAN were normal and unaffected by Covid-19 situation.

Site assessment and certification

Hong Kong has been a GRUAN candidate site since July 2020. The station plans to initiate the certification process in the coming year.

GRUAN-related research

NIL

WG-GRUAN interface

NIL

Other archiving centers

GUAN, GAW (WOUDC, WDCGG, WRDC)

Participation in campaigns

NIL

Future plans

- Explore the inclusion of cloud observation, which is not performed on site, in the submitted data.
- Continue to explore including GNSS data flow.

GRUAN Site Report for HongKong (HKO), 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	HongKong
Unique GRUAN ID	HKO
Geographical position	22.3100 °N, 114.1700 °E, 65.0 m
Operated by	HKO | Hong Kong Observatory
Main contact	Lam, Jason
WMO no./name	45004 Kowloon
Operators	currently 2, changes +0 / -0
Sounding Site	2

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
HKO-RS-01	Hong Kong automatic upper-air sounding system	Sounding Site	2	729
HKO-RS-02	Hong Kong manual upper-air sounding system	Sounding Site	3	80

1.2 General comments from Lead Centre

No comments from Lead Centre.

2 System: Hong Kong automatic upper-air sounding system (HKO-RS-01)

Object	Value
System name	Hong Kong automatic upper-air sounding system
Unique GRUAN ID	HKO-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	22.3116 °N, 114.1726 °E, 66.0 m
Operated by	HKO | Hong Kong Observatory
Instrument contact	Lam, Jason
Started at	2004-01-01
Defined setups	2 (ROUTINE, AD-HOC)
Possible streams	RS41

2.1 Lead Centre comments

2.1.1 Dataflow

Operational dataflow of radiosonde measurement data to the GRUAN LC started in July 2022.

Currently, the dataflow includes radiosoundings with Vaisala RS41-SG.

2.1.2 General

This is the autolauncher system.

Large variability in burstpoint altitude is visible which looks like an apparent bimodal distribution 10 hPa and 100 hPa.

2.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

2.2.1 Stream: RS41

RS41		729	729	
RS41-RAW	001		728	
RS41-EDT	001		728	
RS41-GDP	001		721	

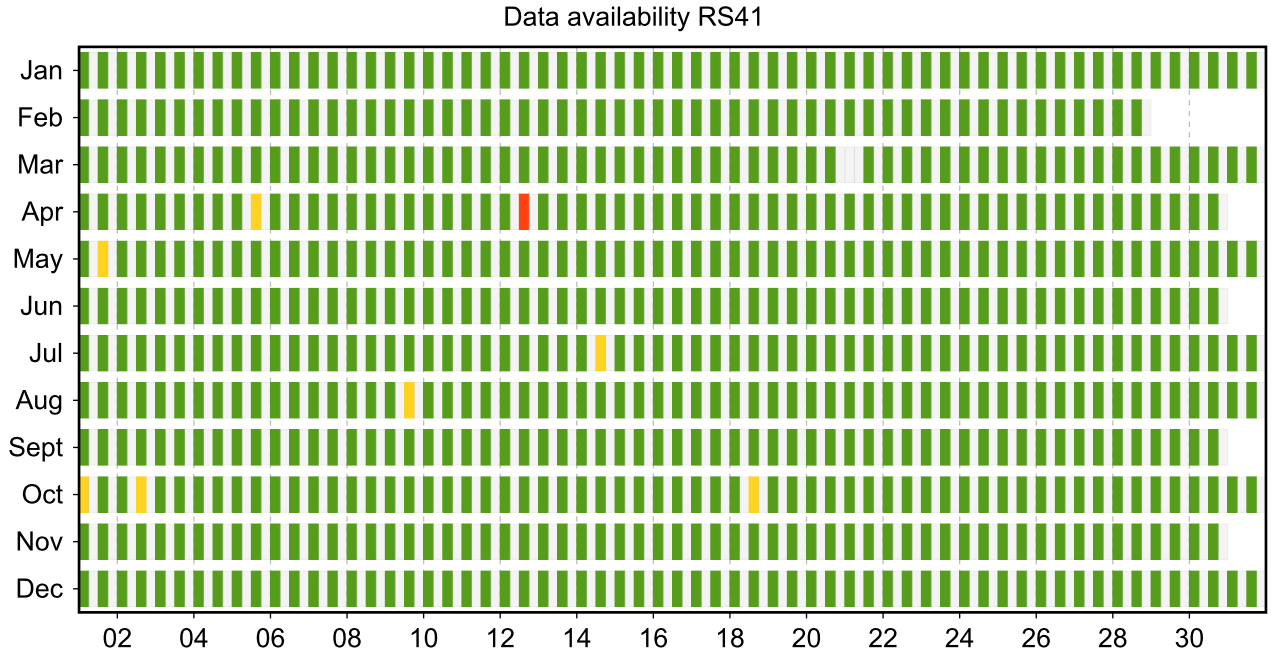
2.3 Availability of data products

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.

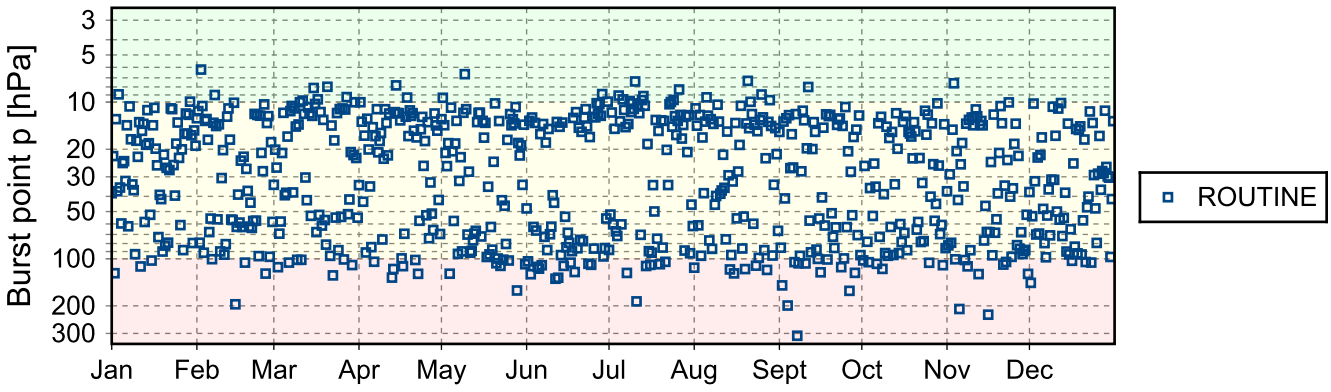
2.3.1 Stream: RS41



2.4 Instrument combinations of HKO-RS-01

Count	Instrument combination
729	RS41

2.6 Measurement events



3 System: Hong Kong manual upper-air sounding system (HKO-RS-02)

Object	Value
System name	Hong Kong manual upper-air sounding system
Unique GRUAN ID	HKO-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	22.3117 °N, 114.1726 °E, 66.0 m
Operated by	HKO | Hong Kong Observatory
Instrument contact	Lam, Jason
Started at	1951-01-01
Defined setups	3 (OZONE, MOISTURE, AD-HOC)
Possible streams	CFH, ECC, RS41

3.1 Lead Centre comments

3.1.1 Dataflow

Operational dataflow of radiosonde measurement data to the GRUAN LC since October 2020.

Currently, the dataflow includes radiosoundings with Vaisala RS41-SG, ECC Ozone and CFH. All data are transmitted using the RsLaunchClient within one quarter after the sounding.

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

3.1.2 General

This is the manual launching site.

Good performance of stratospheric water vapor measurement programm (CFH) and ECC ozone soundings can be confirmed.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
3.2.1 Stream: CFH				
CFH		9	9	
3.2.2 Stream: ECC				
ECC		49	49	
3.2.3 Stream: RS41				
RS41		80	80	
RS41-RAW	001		80	
RS41-EDT	001		80	
RS41-GDP	001		76	

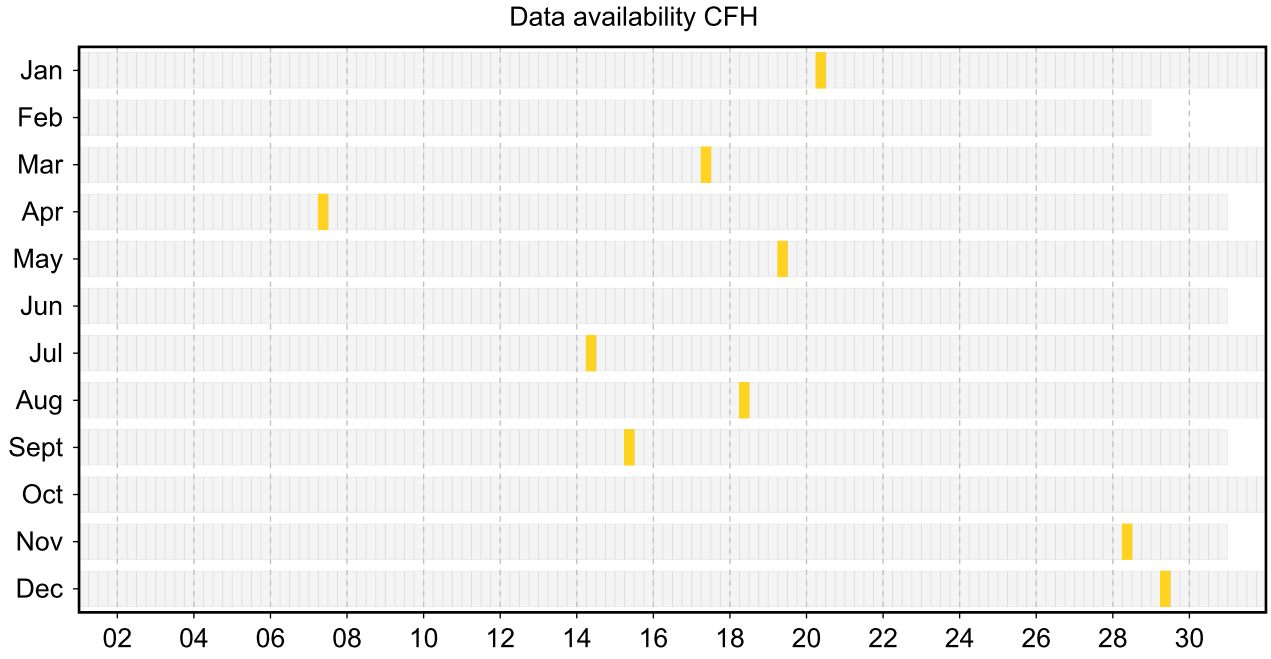
3.3 Availability of data products

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).

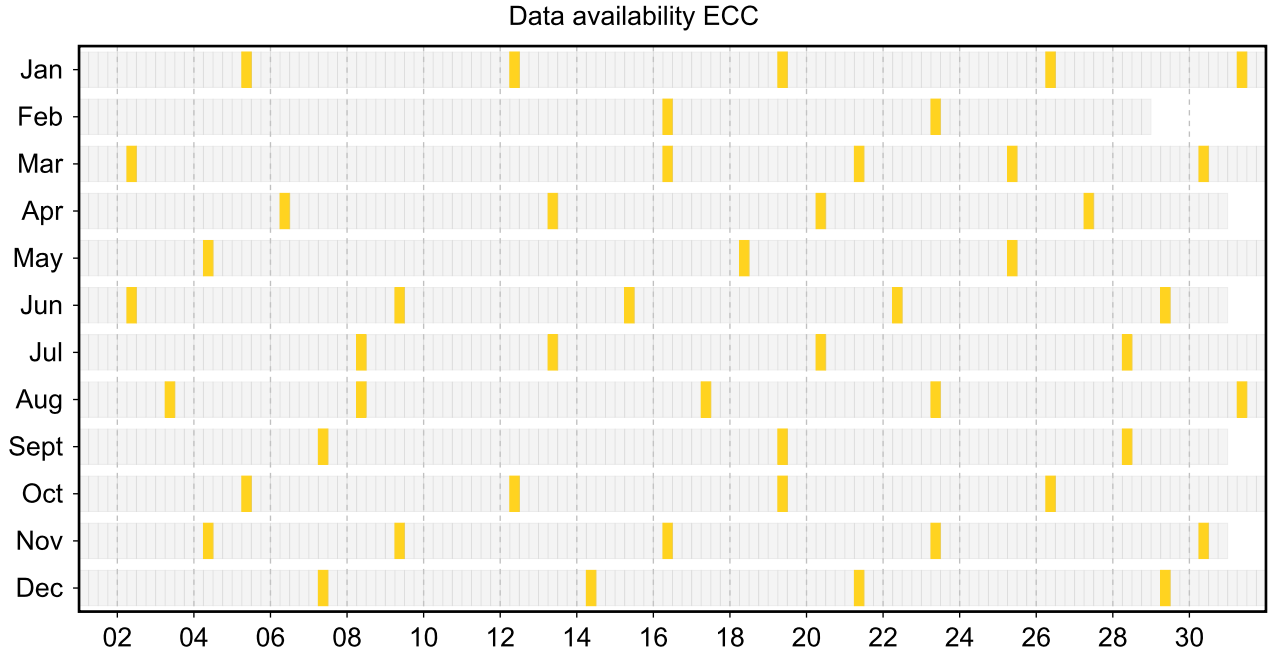
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

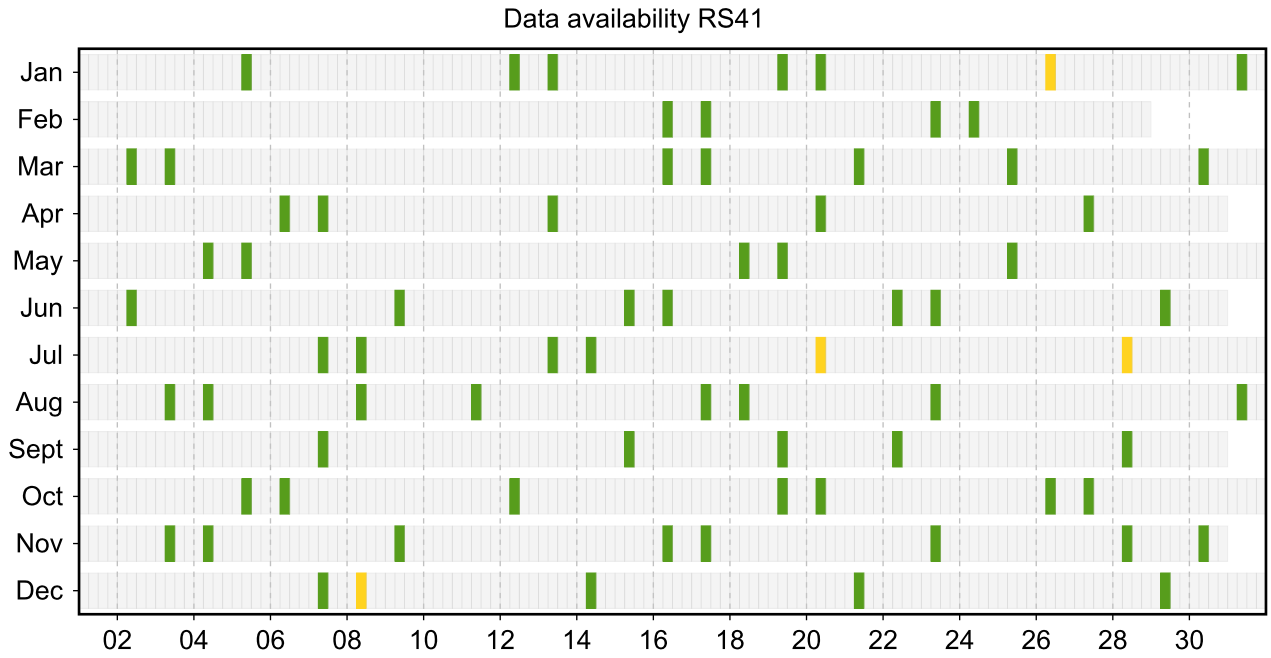
3.3.1 Stream: CFH



3.3.2 Stream: ECC



3.3.3 Stream: RS41



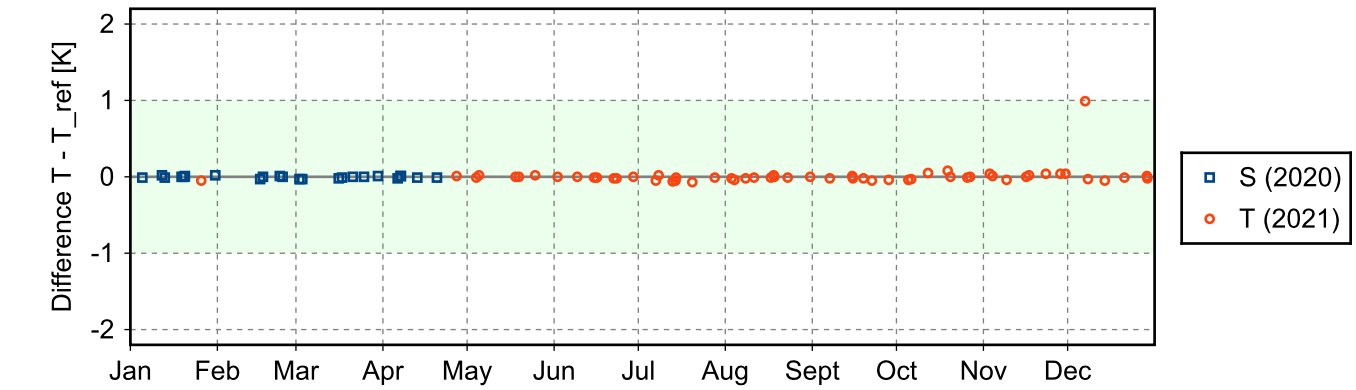
3.4 Instrument combinations of HKO-RS-02

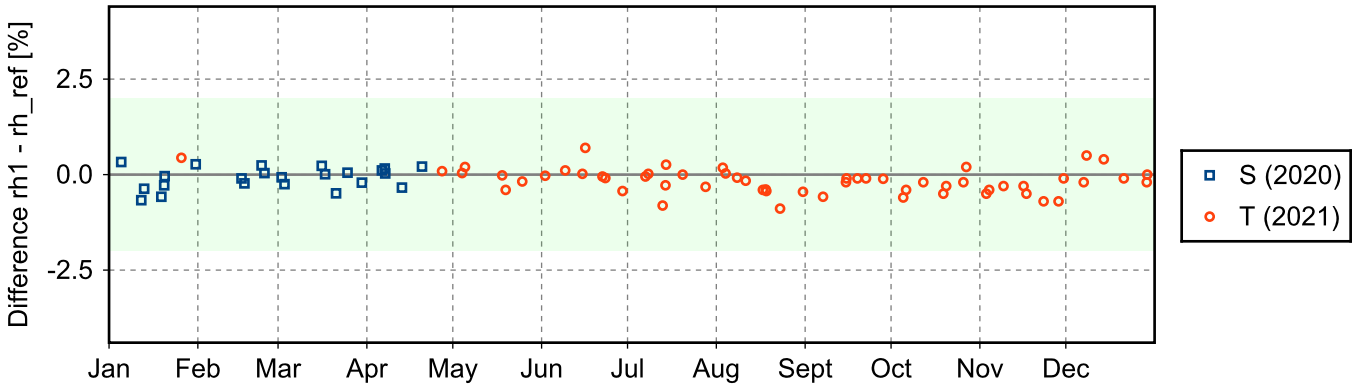
Count	Instrument combination
9	CFH, RS41
49	ECC, RS41
22	RS41

3.5 Instrument ground check

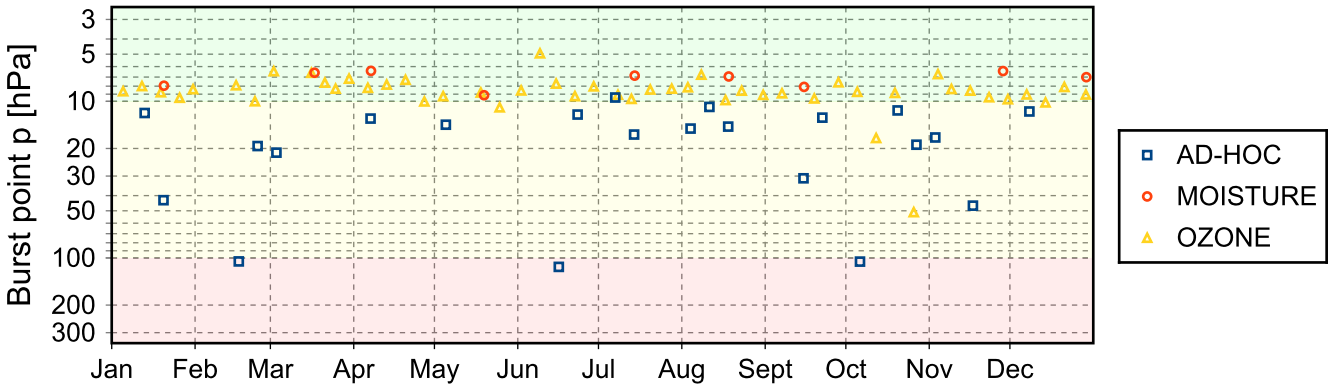
3.5.1 Stream: RS41

(1) GroundCheck: GC-SHC





3.6 Measurement events



GRUAN Site Report for HongKong (HKO), 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	HongKong
Unique GRUAN ID	HKO
Geographical position	22.3100 °N, 114.1700 °E, 65.0 m
Operated by	HKO | Hong Kong Observatory
Main contact	Lam, Jason
WMO no./name	45004 Kowloon
Operators	currently 2, changes +0 / -0
Sounding Site	2

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
HKO-RS-01	Hong Kong automatic upper-air sounding system	Sounding Site	2	728
HKO-RS-02	Hong Kong manual upper-air sounding system	Sounding Site	3	90

1.2 General comments from Lead Centre

No comments from Lead Centre.

2 System: Hong Kong automatic upper-air sounding system (HKO-RS-01)

Object	Value
System name	Hong Kong automatic upper-air sounding system
Unique GRUAN ID	HKO-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	22.3116 °N, 114.1726 °E, 66.0 m
Operated by	HKO | Hong Kong Observatory
Instrument contact	Lam, Jason
Started at	2004-01-01
Defined setups	2 (ROUTINE, AD-HOC)
Possible streams	RS41

2.1 Lead Centre comments

2.1.1 Dataflow

Operational dataflow of radiosonde measurement data to the GRUAN LC started in July 2022.

Currently, the dataflow includes radiosoundings with Vaisala RS41-SG.

2.1.2 General

This is the autolauncher system.

Too low, and large variability in burstpoint altitude are visible until October 2023. After this date, there is a strong improvement, so that the mayority of soundings reach 10 hPa and higher. However, the documentation (metadata) of these flights doesn't show any change. Has the balloon type been changed? If so, this should definitely be visible in the metadata of the soundings.

2.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

2.2.1 Stream: RS41

RS41		728	728	
RS41-RAW	001		728	
RS41-EDT	001		727	
RS41-GDP	001		721	

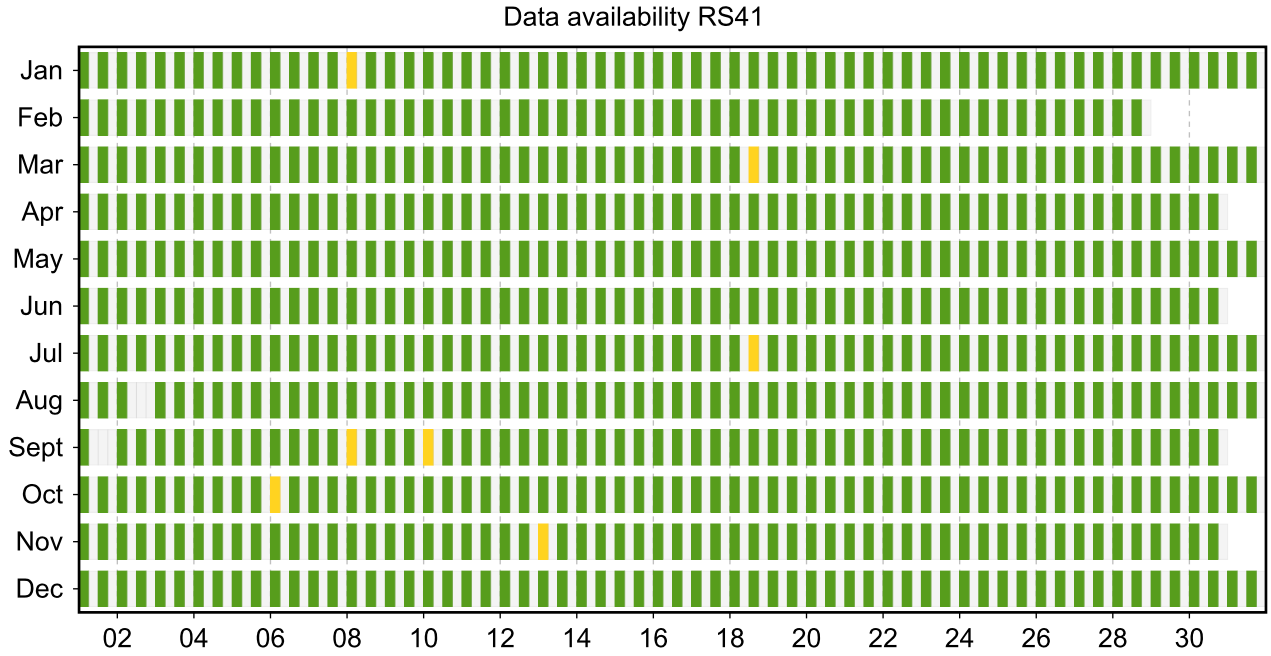
2.3 Availability of data products

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.

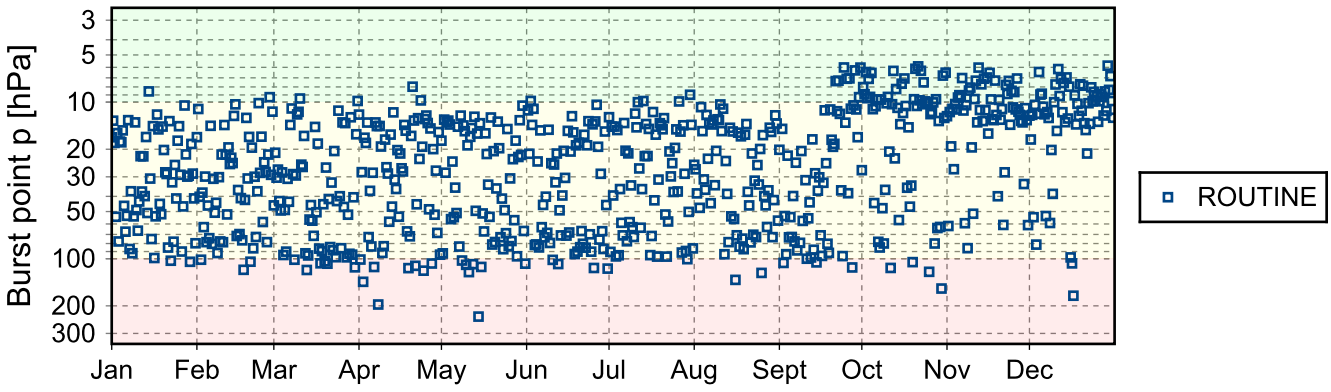
2.3.1 Stream: RS41



2.4 Instrument combinations of HKO-RS-01

Count	Instrument combination
728	RS41

2.6 Measurement events



3 System: Hong Kong manual upper-air sounding system (HKO-RS-02)

Object	Value
System name	Hong Kong manual upper-air sounding system
Unique GRUAN ID	HKO-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	22.3117 °N, 114.1726 °E, 66.0 m
Operated by	HKO | Hong Kong Observatory
Instrument contact	Lam, Jason
Started at	1951-01-01
Defined setups	3 (OZONE, MOISTURE, AD-HOC)
Possible streams	CFH, ECC, RS41

3.1 Lead Centre comments

3.1.1 Dataflow

Operational dataflow of radiosonde measurement data to the GRUAN LC since October 2020.

Currently, the dataflow includes radiosoundings with Vaisala RS41-SG, ECC Ozone and CFH. All data are transmitted using the RsLaunchClient within one quarter after the sounding.

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

3.1.2 General

This is the manual launching site.

Good performance of stratospheric water vapor measurement programm (CFH) and ECC ozone soundings can be confirmed.

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		52	52	
3.2.3 Stream: RS41				
RS41		90	90	
RS41-RAW	001		90	
RS41-EDT	001		90	
RS41-GDP	001		89	

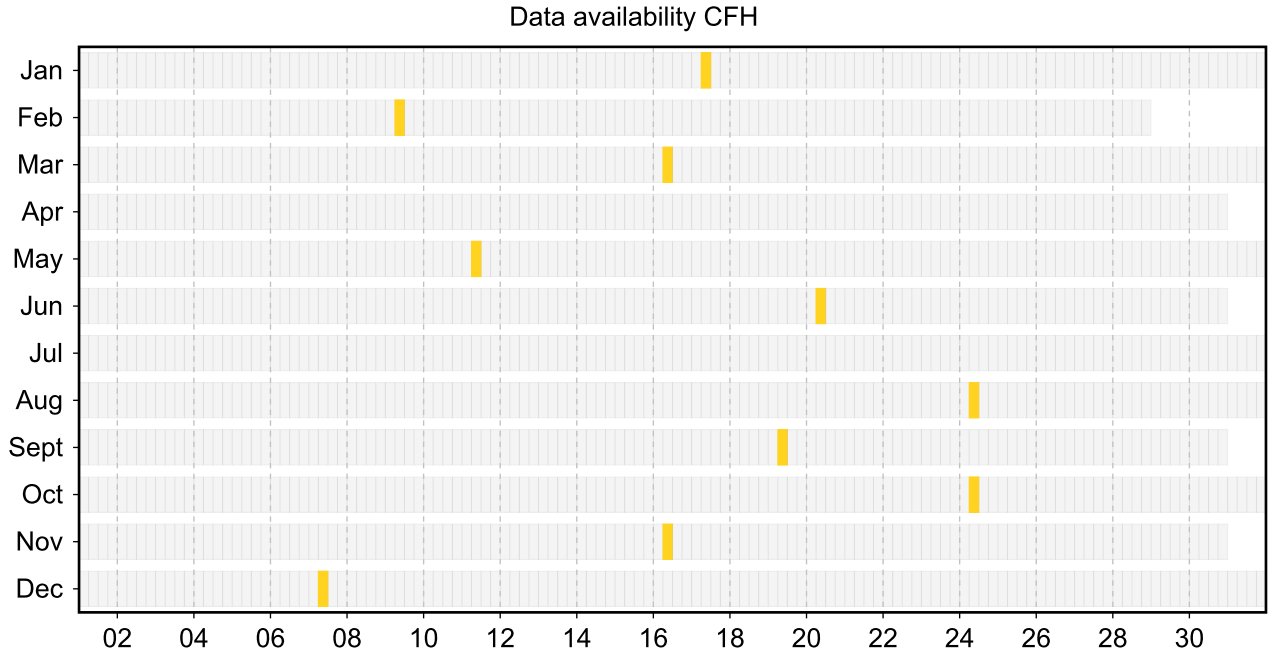
3.3 Availability of data products

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).

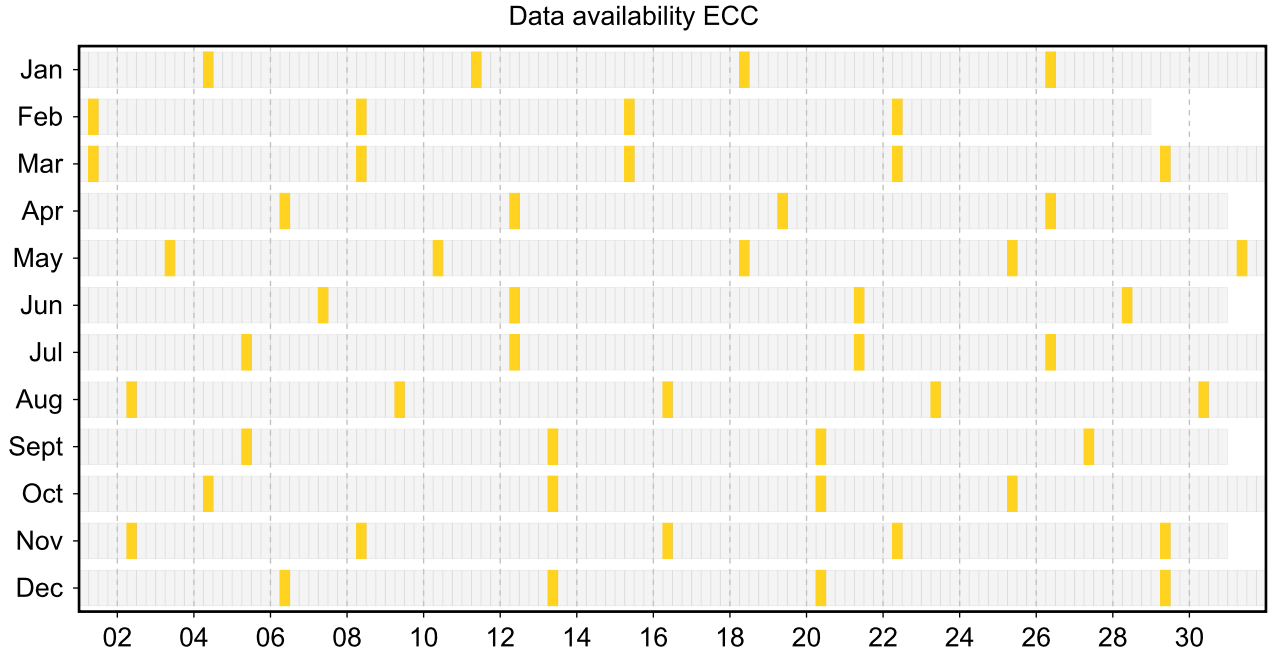
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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

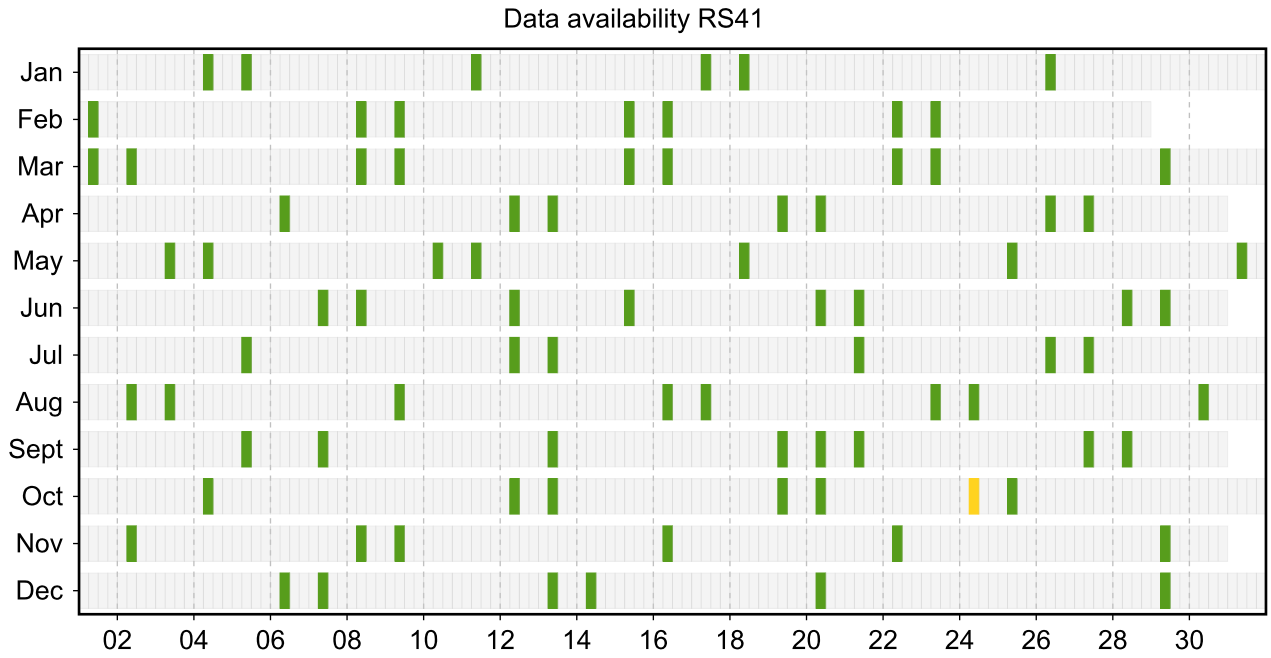
3.3.1 Stream: CFH



3.3.2 Stream: ECC



3.3.3 Stream: RS41



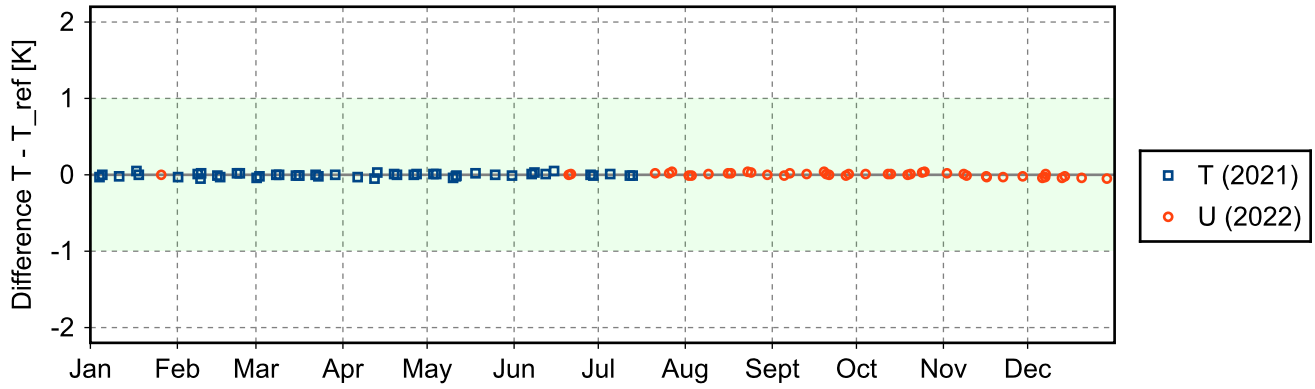
3.4 Instrument combinations of HKO-RS-02

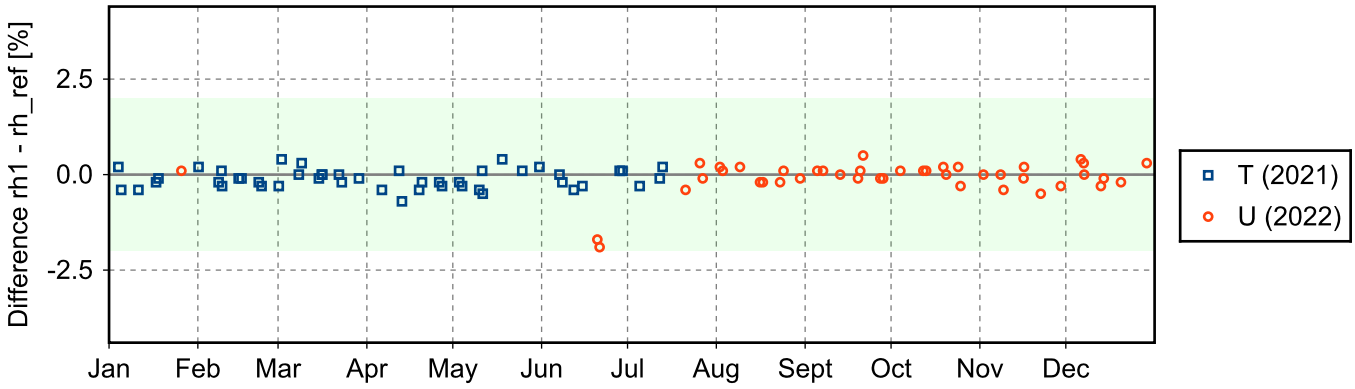
Count	Instrument combination
10	CFH, RS41
52	ECC, RS41
28	RS41

3.5 Instrument ground check

3.5.1 Stream: RS41

(1) GroundCheck: GC-SHC





3.6 Measurement events