Update on GRUAN website

Michael Sommer

GRUAN Lead Centre, DWD

13th GRUAN Implementation and Coordination Meeting (ICM-13)

Virtual, Session 4, 18 November 2021

5th anniversary of this GRUAN website https://www.gruan.org

GCOS Reference Upper-Air Network

The climate reference network

The Global Climate Observing System (GCOS) Reference Upper-Air Network (GRUAN) is an international reference observing network of sites measuring essential climate variables above Earth's surface, designed to fill an important gap in the current global observing system. GRUAN measurements are providing long-term, high-quality climate data records from the surface, through the troposphere, and into the stratosphere. These are being used to determine trends, constrain and calibrate data from more spatially-comprehensive observing systems (including satellites and current radiosonde networks), and provide appropriate data for studying atmospheric processes. GRUAN is envisaged as a global network of eventually 30-40 sites that, to the extent possible, builds on existing observational networks and capabilities.

GRUAN promotional video

This video provides an excellent overview of the goals and principles of GRUAN and its relation to the current challenges in climate research. You can find this and other public outreach material here.

Latest news

Article | 2021-10-25

AMT paper Rosoldi et al. 2021 in review

"Intercomparison of Vaisala RS92 and RS41 radiosonde temperature sensors under controlled laboratory conditions" by Rosoldi et al. The paper is open…

Article | 2021-09-29

AMT paper Lee et al. 2021 in review

"Radiation correction and uncertainty evaluation of RS41 temperature sensors by using an upper-air simulator" by Lee et al. The paper is open for…

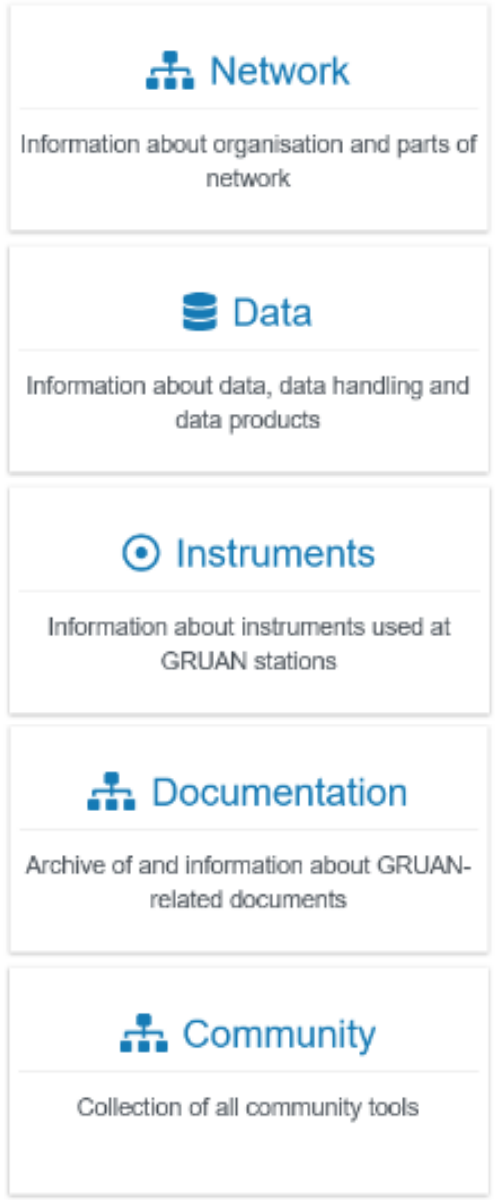
Article Data product | 2021-07-20

AMT paper von Rohden et al. 2021 in review

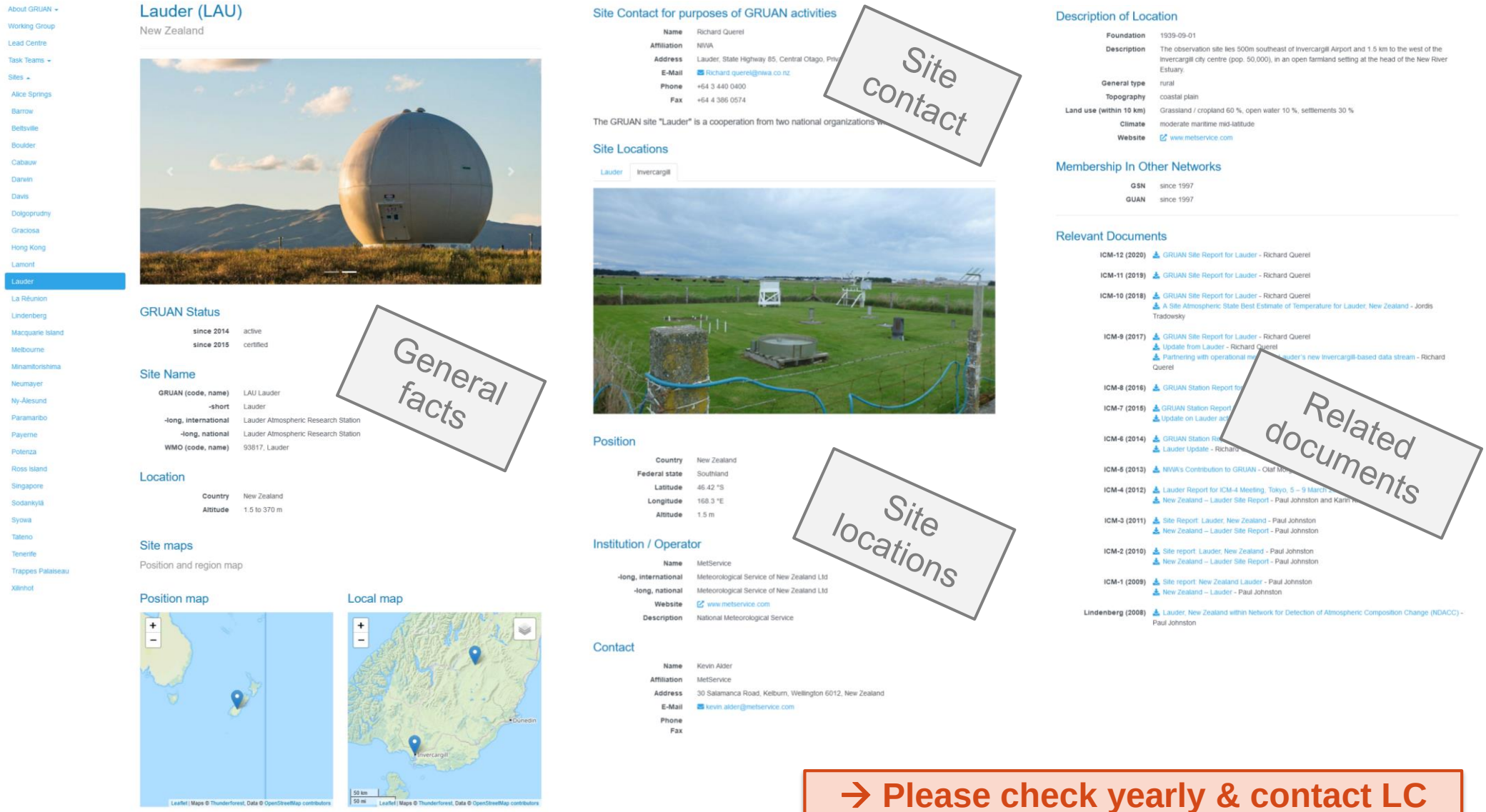
"Laboratory characterisation of the radiation temperature error of radiosondes and its application to the GRUAN data

Main sections

- Network
  - About GRUAN, Working Group, Lead Centre, Task Teams, sites
- Data
  - Measurements, data products, file archive, software, data policy
- Instruments
  - Radiosondes, other in-situ sensors, other instruments
- Documentation
  - WMO/GCOS documents, GRUAN documents (TD, TN, RP), public outreach, peer-reviewed articles, FAQ, conference contributions, other publications
- Community
  - News, meetings, campaigns, awards



Network – Sites

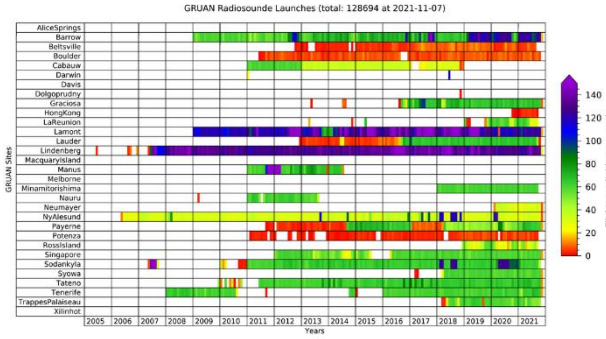


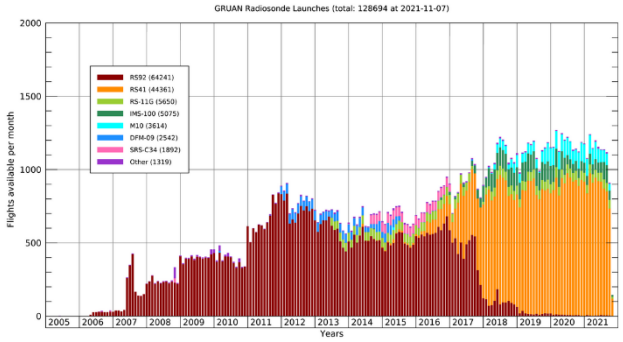
→ Please check yearly & contact LC

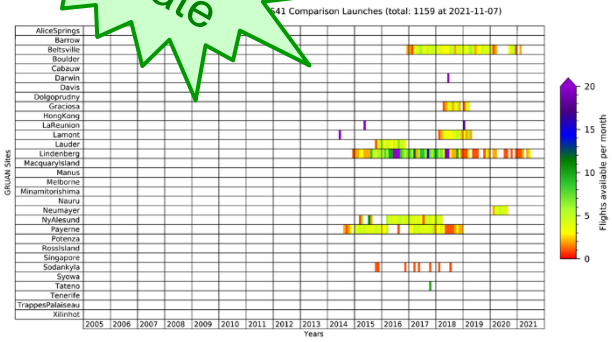
Data section – Measurements

- Sonde launches & comparisons (plots & lists)

weekly update

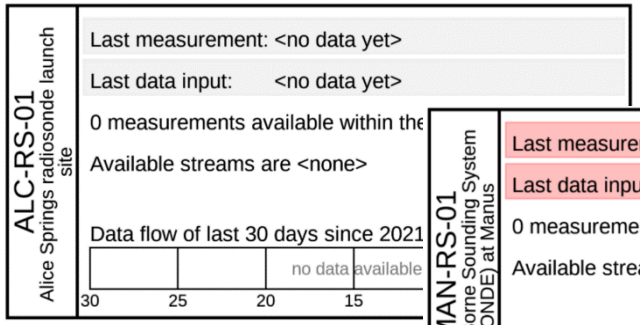


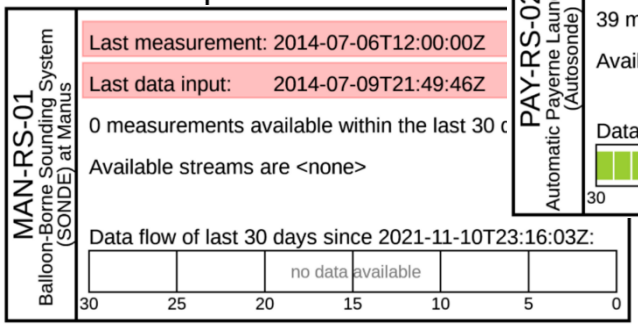


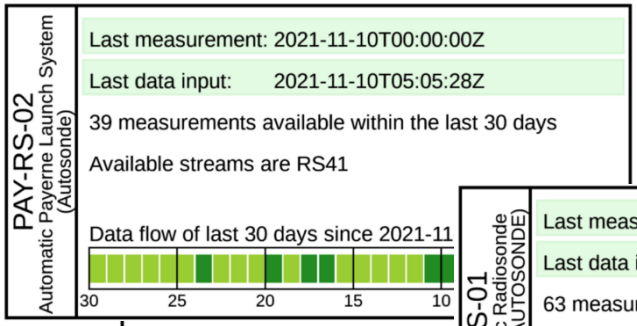


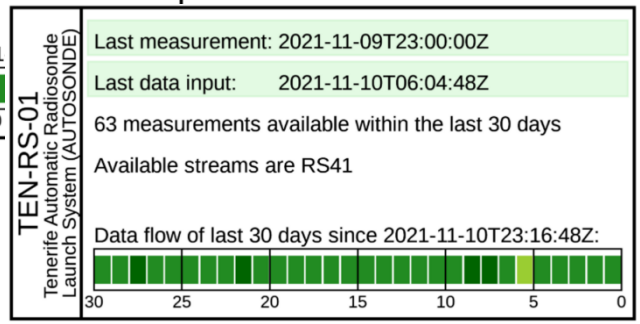
- Status of current data flow (plots) → daily update

daily update







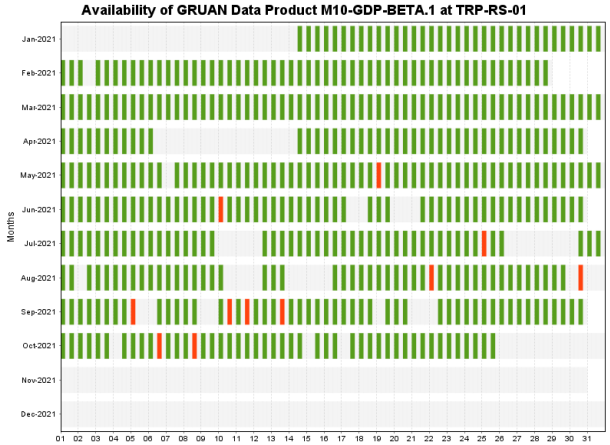


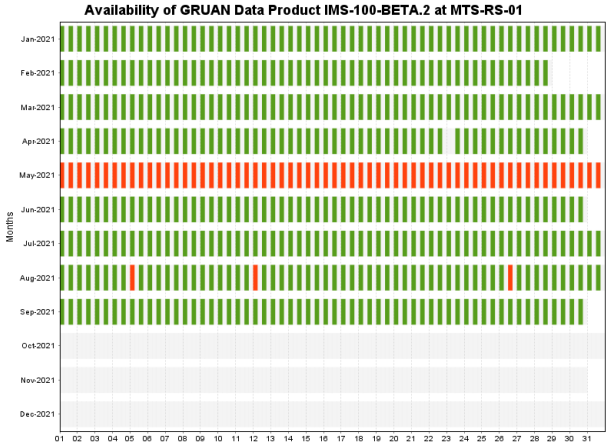
Data section – Data products

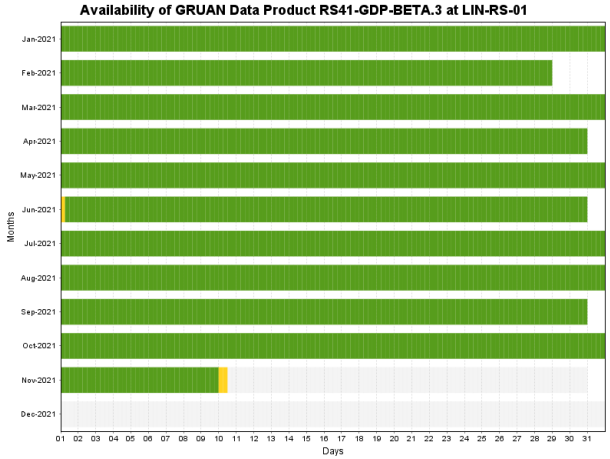
Deutscher Wetterdienst
Wetter und Klima aus einer Hand

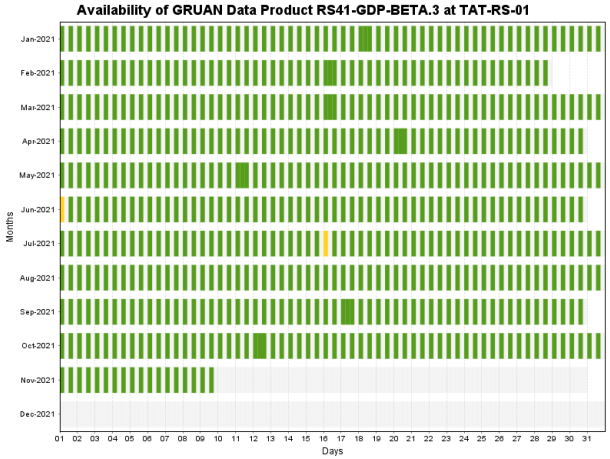
monthly update

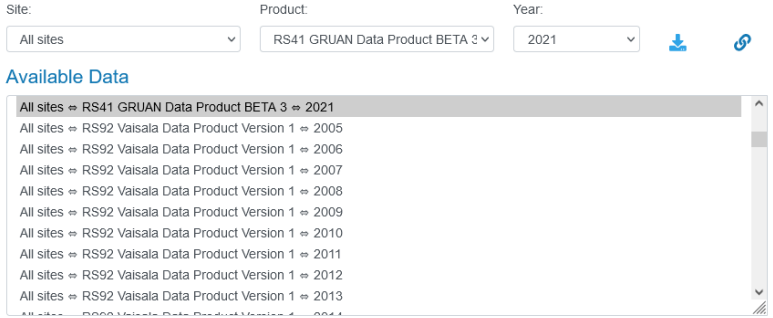
- Availability of data products
  → monthly update

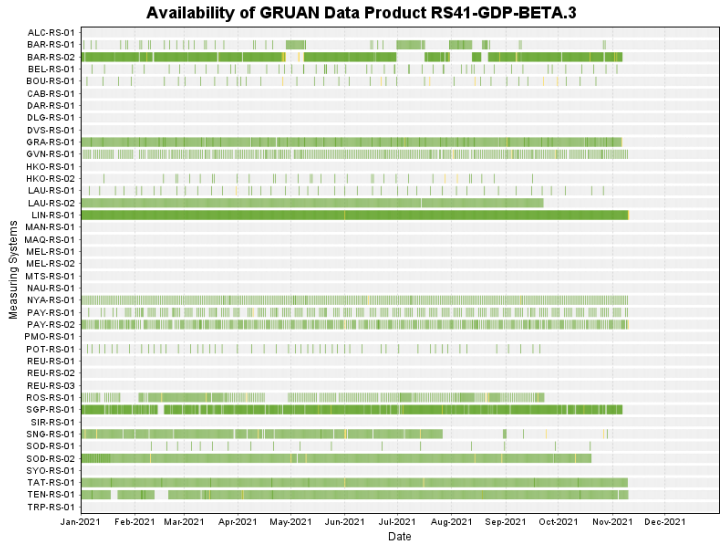












Legend

The data availability status refers to different data products. Currently we have three availability levels and all data we have received are ranked within these three categories:

Available (green): All steps of processing have been successfully completed. The data file is available at NCDC (GDP only) and at GRUAN Lead Centre (all other products).

Unprocessed (yellow): The raw data file has been successfully converted to a GRUAN standardized raw data file format (NetCDF). The processing itself is not done yet, or could not completed. Reason may be missing raw data, or bugs in the processing software.

Development status→ www.gruan.org/data/data-products/development-status

Data section – File archive

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

File archive

Direct access to all published files

National Centers for Environmental Information (NCEI)

FTP access to all certified and published GRUAN data

RS92-GDP.2 ftp://ftp.ncei.noaa.gov/pub/data/gruan/processing/level2/RS92-GDP/version-002 (anonymous ftp)

RS-11G-GDP.1 ftp://ftp.ncei.noaa.gov/pub/data (anonymous ftp)

Anonymous access (NCEI)

GRUAN Lead Centre (at DWD)

Please contact the GRUAN Lead Centre (gruan.lc@dwd.de, formular) to get access to GRUAN data files in following cases.
You need access to:

1. Uncertified GRUAN data products (currently in certification process, or certification process is not started yet)
2. Beta or development versions of upcomming GRUAN data products
3. Converted raw data files
4. Original raw data files
5. RS92 vs. RS41 comparison data set (see also page comparison)

Following information is recommented to send to the GRUAN Lead Centre in case of a request:

- Who are you? (person and institute)
- What is the reason? (study, campaign, comparison, ...)
- Which are the relevant time range and sites?
- Which data products are you interested in?
- All other facts which help us to understand your request.

Data access

Virtual central access point to all available GRUAN data

Please try this version of our virtual file archive. If you find any issue, please contact the GRUAN Lead Centre. If someone needs access to other files, please contact the GRUAN Lead Centre.

RS92-GDP.2 Access to GRUAN data product RS92-GDP.2 (hosted by LC)

RS-11G-GDP.1 Access to GRUAN data product RS-11G-GDP.1 (hosted by LC)

RS92-EDT.1 Access to Vaisala data product

RS41-EDT.1 Access to Vaisala data product

Compare RS41-RS92 Access to GRUAN and Vaisala

Access for all registered user

Beta versions

RS41-GDP-BETA.3 Access to BETA version 3 of RS41 GRUAN data product (hosted by LC)

RS-11G-BETA.2 Access to BETA version 2 of RS-11G-GRUAN data product (hosted by LC)

IMS-100-BETA.2 Access to BETA version 2 of IM

IMS-100-BETA.1 Access to BETA version 1 of IM

M10-GDP-BETA.1 Access to BETA version 1 of M

Access for special user only (BETA tester)

Access to the comparison dataset RS41 - RS92

Hosted by LC

This comparison dataset includes several data products:

- **RS92-GDP.2** (GRUAN): Please find a description about data product on page RS92-GDP.2.
- **RS92-EDT.1** (Vaisala): Please find a description about data product on page RS92-EDT.1.
- **RS41-EDT.1** (Vaisala): Please find a description about this data product on page RS41-EDT.1.

Link to description

search

1 2

Index of: Comparison-DS RS41-RS92 (GRUAN & Vaisala) / RS41-GDP.1 / GVN / 2020

Filter & navigate

Switch to the parent folder

Name	Info	Modified
GVN-RS-01_2_RS41-GDP_001_20200222T120000_1-000-001.nc	4113 KB	2021-11-11
GVN-RS-01_2_RS41-GDP_001_20200229T120000_1-000-001.nc	4134 KB	2021-11-11
GVN-RS-01_2_RS41-GDP_001_20200307T120000_1-000-001.nc	4224 KB	2021-11-11
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GVN-RS-01_2_RS41-GDP_001_20200328T120000_1-000-001.nc	3250 KB	2021-11-11
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GVN-RS-01_2_RS41-GDP_001_20200816T120000_1-000-001.nc	3349 KB	2021-11-11

1 2

Download full folder (if not too large)

Download single files

Data section – Software

- RsLaunchClient
  - Raw data and meta-data collecting tool for radiosounding
- gtRsl – GRUAN Tool RsLaunch
  - Command line tool to prepare simple radiosonde launches for upload to GRUAN
- gt92 – GRUAN radiosonde file converting tool
  - Command line tool for handling radiosonde data files
- gm41 – GRUAN monitor MW41
  - Tool for Vaisala MW41 online Xdata decoding and web visualization

Instruments – Information about

- **Radiosondes** — somewhat limited
  - Different sonde models
  - Descriptions & flight statistics
- **Other sensors** — rudimentary
  - Ozone, water vapour, temperature, aerosol
  - Flight statistics only
- **Other instruments** — missing
  - GNSS, LIDAR, MWR, …

Who can write something? → task team members?

Meisei iMS-100

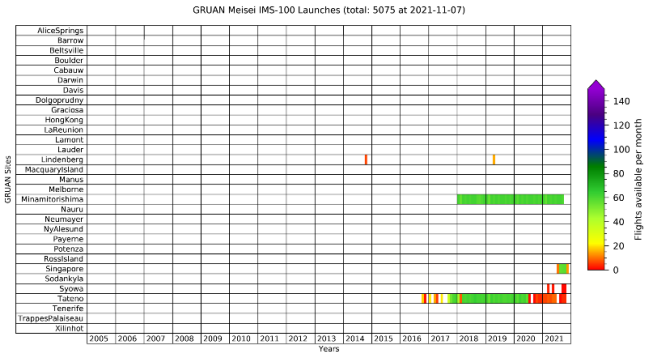
Details

General information

Model	iMS-100
Manufacturer	Meisei (www.meisei.co.jp/english/)
Weight	38 g
Size	55 x 53 x 131 mm
Sensors	Pressure: derived from GPS Temperature: thermistor Humidity: electrostatic capacitance humidity sensor Position: GPS
Measurement cycle	1 s
Available since	2014
Ground system	Ground receiver RD-08AC with MGPS-R sounding software
Ground check	Meisei ground check tool which is part of the Meisei RD-08 Sounding System


Meisei iMS-100

Archived soundings by GRUAN



Data products

- IMS-100-BETA.2 -- development version of IMS-100-GDP.2

Related documents

GRUAN

- GRUAN-TD-5: Kizu et al. (2018): Technical characteristics and GRUAN data processing for the Meisei RS-11G and iMS-100 radiosondes

Meisei

- iMS-100 on the Meisei website
- iMS-100 datasheet (pdf)

Documentation – GRUAN docs

- Technical Documents (TD)
  - with official review process
  - 5 published
  - > 6 in preparation
- Technical Notes (TN)
  - without official review process
  - 10 published
  - > 6 in preparation
- Reports (RP)
  - 4 published

Should information be available on documents in progress?

Global Navigation Satellite System (GNSS) - Precipitable Water (PW) Omnibus

GRUAN-TD-6

Details

ID GRUAN-TD-6

Title Global Navigation Satellite System (GNSS) - Precipitable Water (PW) Omnibus

Authors Junhong Wang, Kalev Rannat, Jonathan Jones, Michael Sommer, Galina Dick, and Matthew Hanson

Last version v2.0 (2019-08-21)

Status Published

Download PDF

Abstract

This omnibus provides detailed guidelines on the GRUAN GNSS-PW measurement program, including instrumentation, operation procedures and all aspects of data management. It also addresses specific GRUAN requirements, such as reference measurements, measurement uncertainty and managing changes.

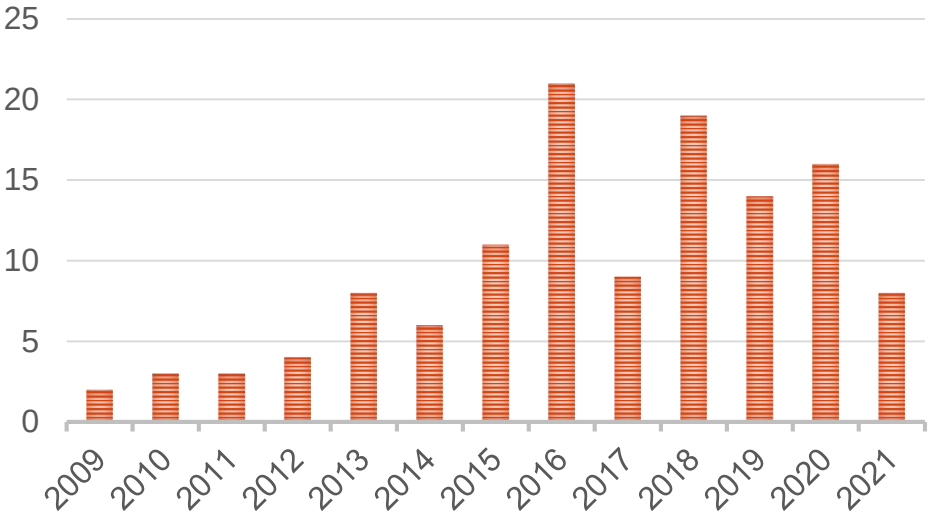
History

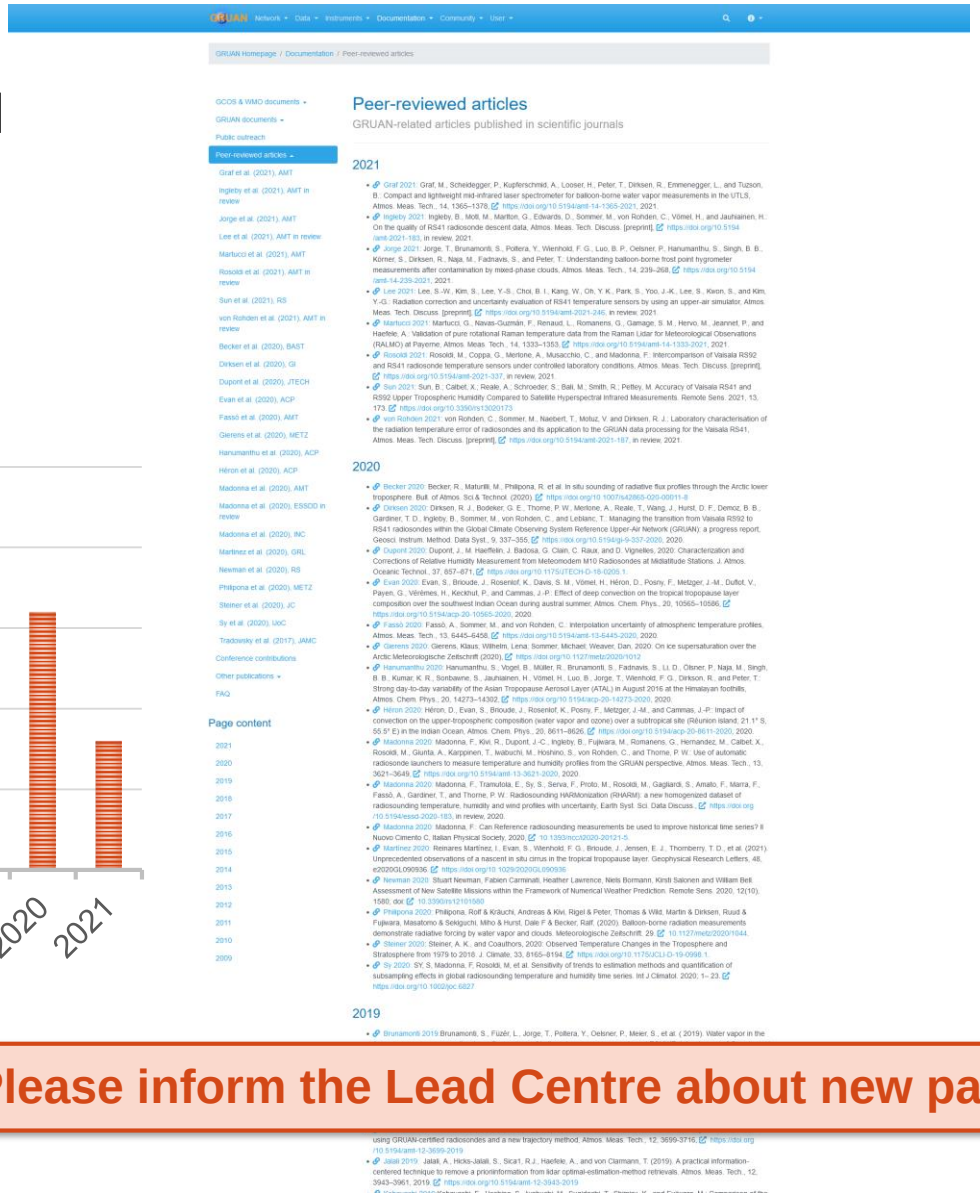
v2.0 (2019-08-21) Wang et al.,Global Navigation Satellite System (GNSS) - Precipitable Water (PW) Omnibus, GRUAN-TD-6, v2.0 (2019-08-21).

v1.0 (2012-05-23) Shoji et al., GRUAN Ground-based GNSS Site Guidelines, GRUAN-TD-6, v1.0 (2012-05-23).

Documentation – Peer-reviewed

- Articles related to GRUAN
  - With reference to one main GRUAN article or document
  - Usage of GRUAN data





→ Please inform the Lead Centre about new papers

Community – News

- Current news topics are
  - New articles, documents
  - Changes related to sites
  - Meetings
  - Data products
  - Other
- More would be possible
  - Campaigns, experiments
  - Other events, e.g. conferences

→ **Please inform the Lead Centre about news**

Community – Meetings

- All GRUAN meetings since beginning
  - Presentations, documents, reports
  - Additional material, e.g. group photos

Meetings

Community meetings, workshops and relevant conferences

GRUAN Implementation-Coordination Meetings (ICM)

- **ICM-13 (Virtual 2021)** 13th GRUAN Implementation-Coordination Meeting (ICM-13), Virtual, 15 November to 19 November 2021.
- **ICM-12 (Virtual 2020)** 12th GRUAN Implementation-Coordination Meeting (ICM-12), Virtual, 16 November to 20 November 2020, Report (pdf).
- **ICM-11 (Singapore 2019)** 11th GRUAN Implementation-Coordination Meeting (ICM-11), Singapore / SG, 20 May to 24 May 2019, Report (pdf).
- **ICM-10 (Potsdam 2018)** 10th GRUAN Implementation-Coordination Meeting (ICM-10), Potsdam / DE, 23 April to 27 April 2018, Report (pdf).
- **ICM-9 (Helsinki 2017)** 9th GRUAN Implementation-Coordination Meeting (ICM-9), Helsinki / FI, 12 June to 16 June 2017, Report (pdf).
- **ICM-8 (Boulder 2016)** 8th GRUAN Implementation-Coordination Meeting (ICM-8), Boulder / US, 25 April to 29 April 2016.
- **ICM-7 (Matera 2015)** 7th GRUAN Implementation-Coordination Meeting (ICM-7), Matera / IT, 23 February to 27 February 2015, Report (pdf).
- **ICM-6 (Greenbelt 2014)** 6th GRUAN Implementation-Coordination Meeting (ICM-6), Greenbelt / US, 10 March to 14 March 2014, Report (pdf).
- **ICM-5 (De Bilt 2013)** 5th GRUAN Implementation-Coordination Meeting (ICM-5), De Bilt / NL, 25 February to 01 March 2013, Report (pdf).
- **ICM-4 (Tokyo 2012)** 4th GRUAN Implementation-Coordination Meeting (ICM-4), Tokyo / JP, 05 March to 09 March 2012, Report (pdf).
- **ICM-3 (Queenstown 2011)** 3rd GRUAN Implementation-Coordination Meeting (ICM-3), Queenstown / NZ, 28 February to 4 March 2011, Report (pdf).
- **ICM-2 (Payerne 2010)** 2nd GRUAN Implementation-Coordination Meeting (ICM-2), Payerne / CH, 2 to 4 March 2010, Report (pdf).
- **ICM-1 (Norman 2009)** 1st GRUAN Implementation-Coordination Meeting (ICM-1), Norman / US, 2 to 4 March 2009, Report (pdf).
- **IM (Lindenberg 2008)** Implementation Meeting of GCOS Reference Upper Air Network, Lindenberg / DE, 26 to 28 February 2008, Report (pdf).
- **UAWS-2 (Seattle 2006)** GCOS/NOAA Upper-Air Workshop II, Seattle / US, 22 to 24 May 2006.
- **UAWS-1 (Boulder 2005)** NOAA/GCOS Workshop to Define Climate Requirements for Upper-Air Observations, Boulder / US, 8 to 11 February 2005.

Workshops

- **NEW (Fürstenwalde 2012)** The GRUAN Workshop to Develop Network Design and Expansion Criteria, Fürstenwalde / DE, 13-15 June 2012, Report (GRUAN-RP-4).

Conclusion

- Available since 5 years → https://www.gruan.org
- Comprehensive information → Data, documents, papers, news, meetings
- More content needed → e.g. section instruments
- Website of whole GRUAN community

  → Contributions are very welcome

Please give feedback and contribute!

gruan.lc@dwd.de