

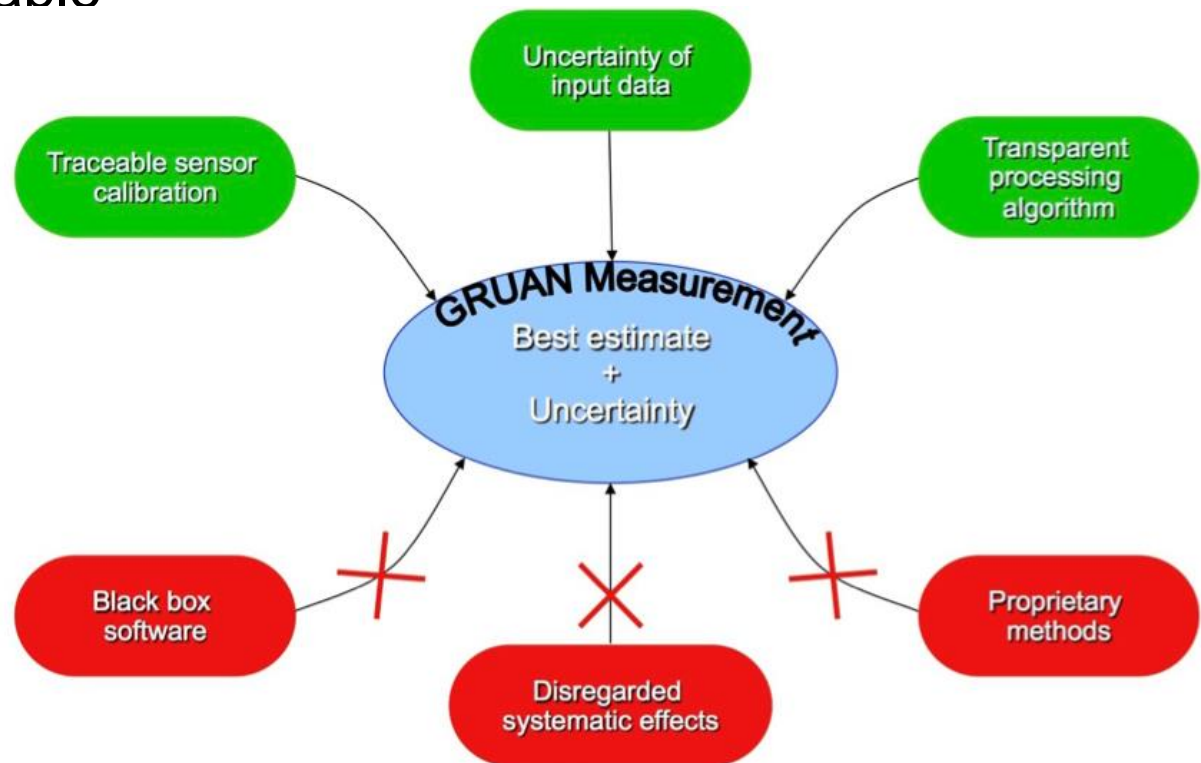


Status of all GDPs under development

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14th GRUAN Implementation and Coordination Meeting (ICM-14)
Saint Denis, La Reunion
28 Nov - 2 Dec 2022

- From the GRUAN-for-beginners presentation:
To answer the need [of WMO and the Global Climate Observing System] for highest accuracy data possible
- GRUAN's main deliverable



- Outlined in TN-1 & TN-4
 - Technical document with full description of the data processing
 - Peer reviewed paper on the data product
 - Measurement System employed within GRUAN
 - Central processing facility
 - Existing operational data stream
 - Review/validation of the data stream

Certified

RS92 V2
RS-11G V1
GNSS-PW*
RS41**
iMS-100**

*NetCDFdata format not implemented yet

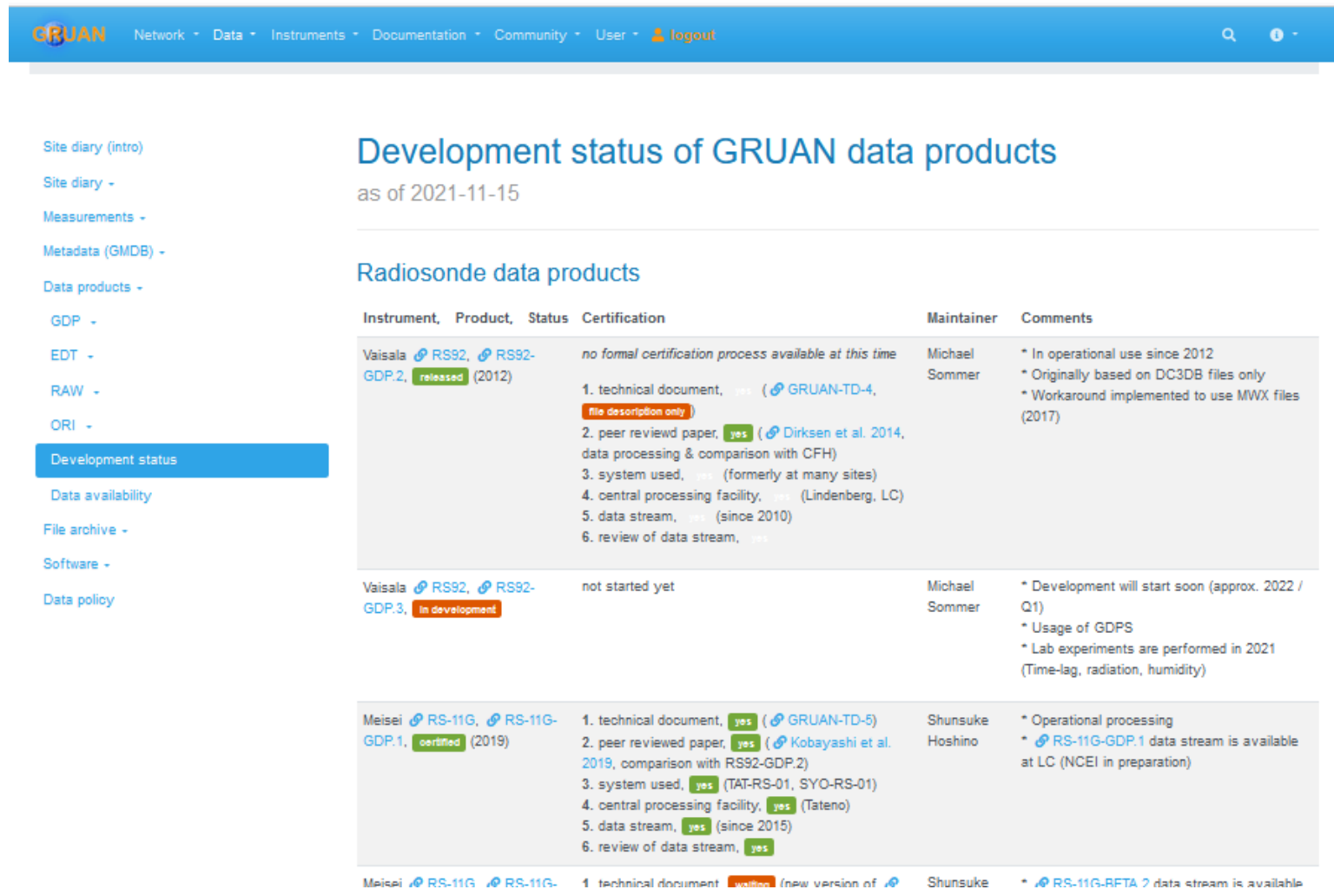
** provisional certification

Under development

RS-11G V2
M10
Graw DFM09/DFM17
RS92 V3
CFH/FPH
MWR
Lidar
O₃



Accessible in the restricted area (Data | Data Products | Development Status)



The screenshot shows the GRUAN website interface. The top navigation bar includes links for Network, Data, Instruments, Documentation, Community, User, and a logout button. A search icon and a user profile icon are also present. The left sidebar contains a menu with options like Site diary, Measurements, Metadata, Data products, and Development status (which is highlighted). The main content area is titled "Development status of GRUAN data products as of 2021-11-15" and features a section for "Radiosonde data products". This section contains a table with columns for Instrument, Product, Status, Certification, Maintainer, and Comments.

Instrument	Product	Status	Certification	Maintainer	Comments
Vaisala	RS92, RS92-GDP.2	released (2012)	<ul style="list-style-type: none"> no formal certification process available at this time 1. technical document, GRUAN-TD-4, file description only 2. peer reviewd paper, Dirksen et al. 2014, data processing & comparison with CFH 3. system used, (formerly at many sites) 4. central processing facility, (Lindenberg, LC) 5. data stream, (since 2010) 6. review of data stream, (yes) 	Michael Sommer	<ul style="list-style-type: none"> * In operational use since 2012 * Originally based on DC3DB files only * Workaround implemented to use MWX files (2017)
Vaisala	RS92, RS92-GDP.3	In development	not started yet	Michael Sommer	<ul style="list-style-type: none"> * Development will start soon (approx. 2022 / Q1) * Usage of GDPs * Lab experiments are performed in 2021 (Time-lag, radiation, humidity)
Meisei	RS-11G, RS-11G-GDP.1	certified (2019)	<ul style="list-style-type: none"> 1. technical document, GRUAN-TD-5, yes 2. peer reviewed paper, Kobayashi et al. 2019, comparison with RS92-GDP.2 3. system used, TAT-RS-01, SYO-RS-01, yes 4. central processing facility, Tateno, yes 5. data stream, (since 2015), yes 6. review of data stream, (yes) 	Shunsuke Hoshino	<ul style="list-style-type: none"> * Operational processing * RS-11G-GDP.1 data stream is available at LC (NCEI in preparation)
Meisei	RS-11G, RS-11G-GDP.2	evolution	1. technical document, (new version of)	Shunsuke	* RS-11G-RFTA 2 data stream is available

GDP development status – certified products

System	data processor	centralized processing facility	GRUAN documentation	Peer reviewed paper	GRUAN certification	Topics covered by paper
Vaisala RS92	yes	yes	GRUAN TN4 (data format)	Dirksen et al 2014 (AMT)	de facto certified, although never officially	Data processing & comparison with CFH
Meisei RS-11G V1	yes	yes	GRUAN TD5 (processing & data format)	Kobayashi et al 2019 (AMT)	completed	comparison with RS92
GNSS	yes	yes	yes	Ning et al 2016 (AMT)	completed	uncertainty
Vaisala RS41	yes	yes	under review	Rohden et al 2021 (AMTD)	provisionally	Radiation correction
Meisei IMS-100	yes	yes	Update TD5 in progress	Hoshino et al 2022 (AMT)	provisionally	comparison with RS92

GDP development status – in development

System	data processor	centralized processing facility	GRUAN documentation	Peer reviewed paper	GRUAN certification	Topics covered by paper
Meisei RS-11G V2	yes	yes	Update TD5 in progress			
Modem M10	beta version	yes	in preparation/under review	Dupont et al. 2020 (JAOT)		Humidity correction
Graw DFM09/DFM17	in progress	no	no	no		
Meteolabor SRS 34C	yes	yes			halted	
Meteolabor SRS 50C	?	yes			halted	
Ozone	in progress	no	Under review/update	ASOPOS		
lidar	yes	yes	in progress	Leblanc et al 2016 (AMT)		Temperature resolution & uncertainty
MWR	in progress	in progress	in progress	no		
CFH/FPH	in progress	no	no	e.g. Vömel et al 2016 (AMT)		uncertainties

- RS41: presentation 2-4
- iMS100: presentation 3-2
- M10: presentation 3-2
- Lidar: presentation 9-1
- MWR: presentation 9-2
- CFH/FPH: presentation 9-3
- O₃: presentation 9-4
- GNSS-PW: presentation 10-3

- Development of GRUAN data product is a considerable task. For radiosonde products and GNSS-PW typically 4 years.
 - Multiple persons involved
 - Takes time and resources.

- Based on experience and lessons learned, can the development be sped up?

- Radiosondes: some investments can be re-used
 - Optimized measurement program + set ups + analysis software, modular data processor system

- Not re-usable
 - Data analysis, develop & implement correction algorithms, validation (perform & evaluate twin soundings), documentation