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Lead Centre Progress Report for November 2022

(Submitted by Lead Centre)

Summary and Purpose of this Document

Progress report from the Lead Centre.

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GRUAN Lead Centre
Deutscher Wetterdienst
Lindenberg Meteorological Observatory
Richard-Aßmann-Observatory

GRUAN Lead Centre Progress Report 01/2022

Covering the period 05/2019 to 11/2022

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Summary

Preparation and execution of WMO radiosonde intercomparison campaign (UAII2022)

Barrow (BAR) and Ross Island (ROS) have been certified. Various sites recertified.

New candidate sites Dakar & Paramaribo (PMO)

Co-organization of ICM-12/13/14

Completion of GRUAN data processing for RS41.

New data streams RS41-GDP version 1 and iMS-100-GDP version 2

Research contracts for studies into alternatives to R23 for frostpoint hygrometers.

Health of network

The network consists of 31 sites.

New sites: Ross Island, Paramaribo and Dakar. Data stream PMO progressing, little progress with Dakar/Senegal. No data streams for BoM sites, Dolgoprudny, Xilinhot

New certifications: Ross Island (ROS), Barrow/NSA (BAR)

Certification process ongoing for La Reunion, Neumayer, and Tenerife.

Recertification of various sites (Beltsville, Ny-Ålesund, Sodankylä, Payerne, Potenza, Tateno).

Lead Centre operations

- Operationally running GRUAN data management server - GDMS (24/7).
- Operationally running GRUAN meta-data data base - GMDB (24/7).
- Operationally working GRUAN file archive - GFA (24/7).
- Ongoing development and optimization of all GRUAN server software components, GDMS, GMDB, GFA.
- Ongoing development on several software tools for use at sites, e.g. RsLaunchClient, gt92, gtRsl, gm41.
- Maintenance of GRUAN website (https://www.gruan.org).
- Regularly update of data flow statistic plots (available at website).

- Lists of comparison soundings available at website, e.g. RS92-RS41
- Operational data processing of RS41-GDP.1 and RS92-GDP.2
- Managing data streams for RS41-GDP.1, RS92-GDP.2, RS-11G-GDP.1, and iMS-100-GDP.2

Visitors to LC

- Meteomodem, laboratory tests M10, November 2019
- ETH-Zürich, tests with PCFH, November 2019.
- Alexey Lykov (Dolgoprudny), test of FLASH-B instrument, November 2019.
- T. Gardiner & D. Medland (NPL), discussion GRUAN uncertainties, Sep 2019
- EMPA-Zürich, test with TDL-based stratospheric hygrometer, Dec 2019 & Sep 2022

Instrument research

The following activities were undertaken in testing and/or characterizing research instruments and radiosondes:

- FLASH-B, Meisei Skydew, PCFH.
- RS41, RS92, DFM-09, DFM-17, M10 (laboratory & intercomparison).
- Research contract TU Dresden and FZ Jülich to investigate alternatives for R23.
- Research contract to investigate added value GRUAN data processing

Site visits

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Conferences

- CIMO-TECO, Geneva June 2019
- EGU general assembly 2021 (video conference)
- EMS 2021 (video conference)

Achievements

- Development of GRUAN data processor for RS41 (version 1) completed
- Preparation and execution of WMO radiosonde intercomparison campaign (UAII2022) in cooperation with Payerne. The radiosounding part of the campaign was performed August-September 2022, the laboratory part comprised 6 2-week slots from February to November 2022.

GRUAN Technical documentation and Reports published

- GRUAN-TD-7 - Review of Multiple-payload Radiosonde Sounding Configurations for Determining Best-Practice Guidance for GRUAN Sites.
- GRUAN-TN-6 – Brief Description of GruanToolRsLaunch (gtRsl)
- GRUAN-TN-8 – [3 updates] GRUAN Monitor MW41 and the Vaisala RS41 Additional Sensor Interface
- GRUAN-TN-9 – Site Photographs Guide
- GRUAN-TN-11 – Brief description of GruanToolRs92
- GRUAN-TN-12 – Brief Description of Vaisala DigiCORA® 3 DataBase File Format (DC3DB)
- GRUAN-TN-13 – User Guide for the RS41 GRUAN Data Product Version 1 (RS41-GDP.1)
- GRUAN-RP-5 – Cloud Observations

Peer-reviewed papers published

- von Rohden et al., *Laboratory characterisation of the radiation temperature error of radiosondes and its application to the GRUAN data processing for the Vaisala RS41*, Atmos. Meas. Tech., **15**(2), 383–405, doi:10.5194/amt-15-383-2022, 2022.
- Dirksen et al., *Managing the transition from Vaisala RS92 to RS41 radiosondes within the Global Climate Observing System Reference Upper-Air Network (GRUAN): a progress report*, Geoscientific Instrumentation, Methods and Data Systems, **9**(2), 337–355, doi:10.5194/gi-9-337-2020, 2020.

Training by Lead Centre

- AWI Ny-Alesund staff

Issues

- Silent sites

Work plan for next 12 months

- Prepare report of WMO-CIMO Radiosonde intercomparison campaign.
- Start development of GRUAN data product for RS92 (RS92-GDP.3).
- Support development of GRUAN data product for Modem M10, M20 & Graw DFM-09, DFM-17 radiosondes, including laboratory investigations
- Further development of the laboratory experiments
- Complete the GRUAN radiosonde omnibus.
- Continue development of alternative, non-R23 based, cooling mechanisms for frostpoint hygrometers.
- Test Skydew instrument
- (Re)certify sites.
- Publish result of GRUAN-wide RS92-RS41 comparison
- Further development of the GRUAN website.
- Operationalize processing of CFH data.

Overview of GRUAN-related publications

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Colombo, P. and A. Fassò, Quantifying the interpolation uncertainty of radiosonde humidity profiles, Measurement Science and Technology, 33(7), 074,001, doi:10.1088/1361-6501/ac5bff, 2022, URL https://doi.org/10. 1088/1361-6501/ac5bff.

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