GRUAN Lead Centre

Lead Centre report

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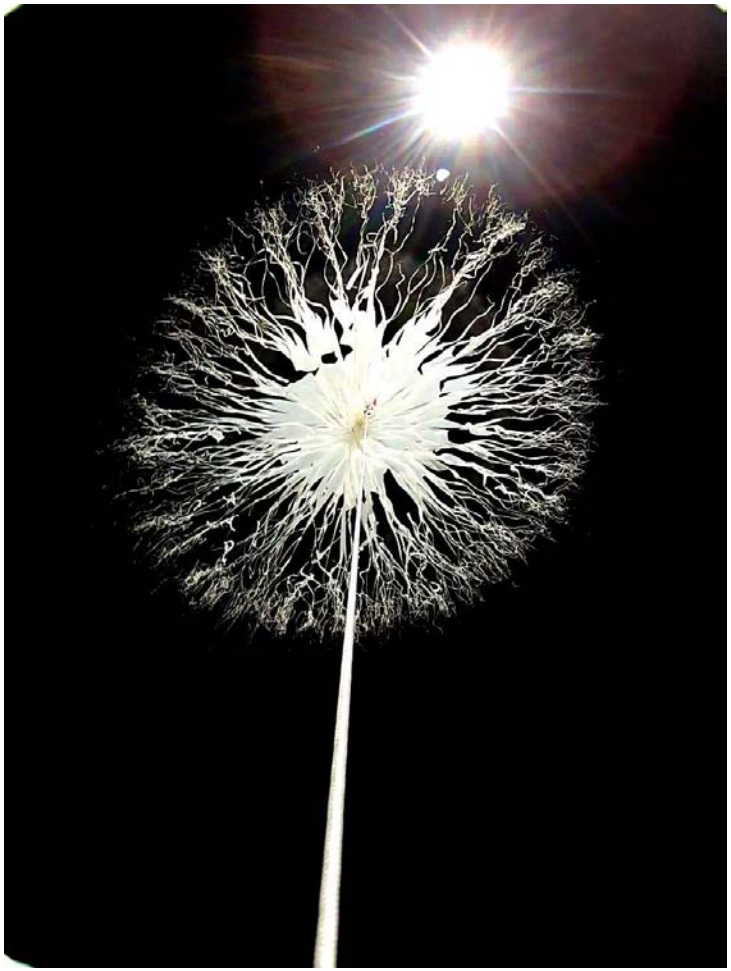
GRUAN Lead Center
DWD Meteorological Observatory Lindenberg

ICM-8

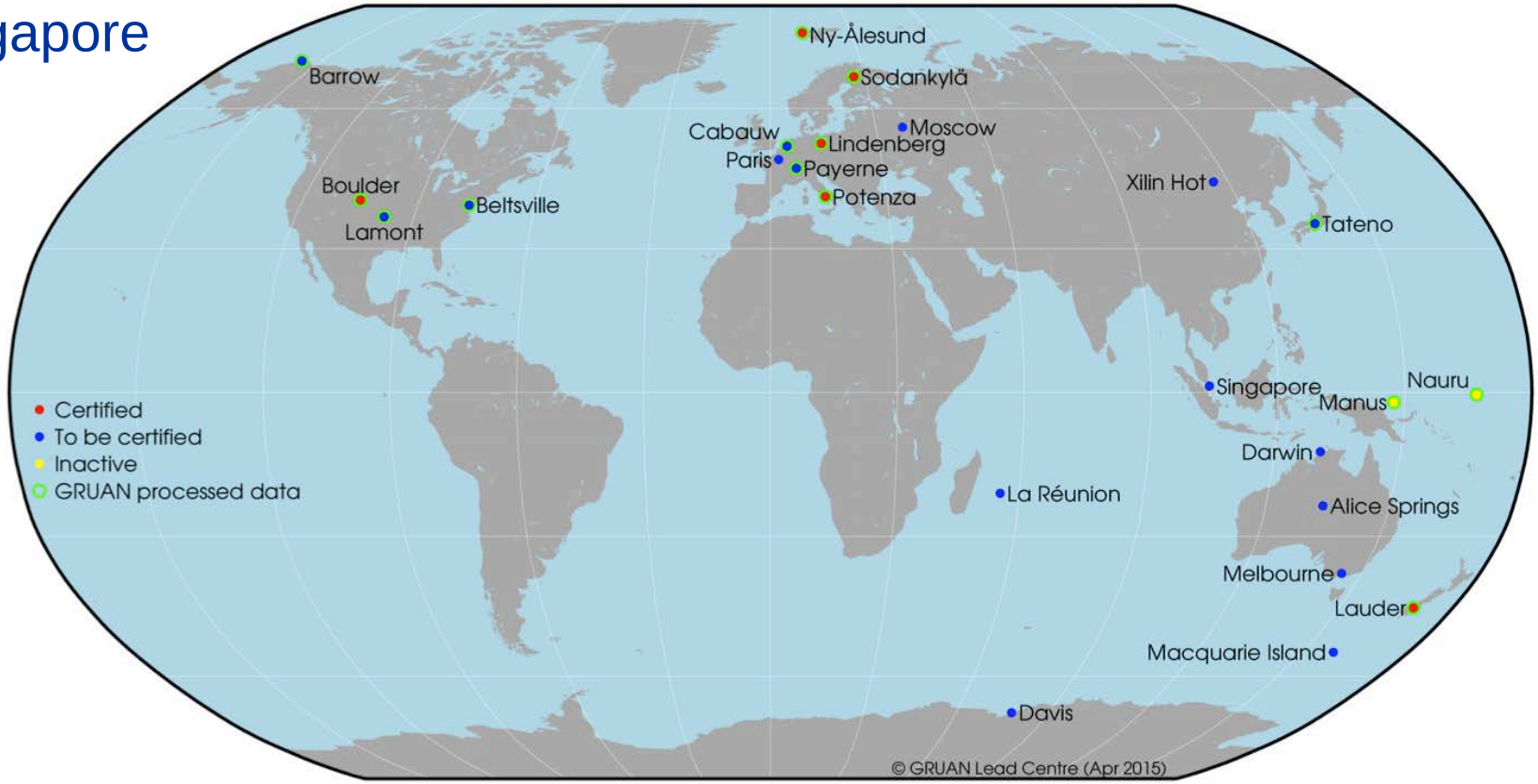
25 April 2016



Network status

7 new candidate sites:

- Darwin, Melbourne, Alice Springs, Macquarie Island, Davis (AUS)
- Dolgoprudny (Moscow)
- Singapore



Site certification status

- Certified in 2015:

  Payerne, Potenza, Sodankyla

- Recently certified:

  Cabauw

- Under review:

  Beltsville, Tateno

Certification procedures are being coordinated by the Lead Center

Staff

☺ New LC head appointed 1 April 2015

☺ Christoph von Rohden joined LC November 2015

☹ Development of GRUAN is limited by available resources

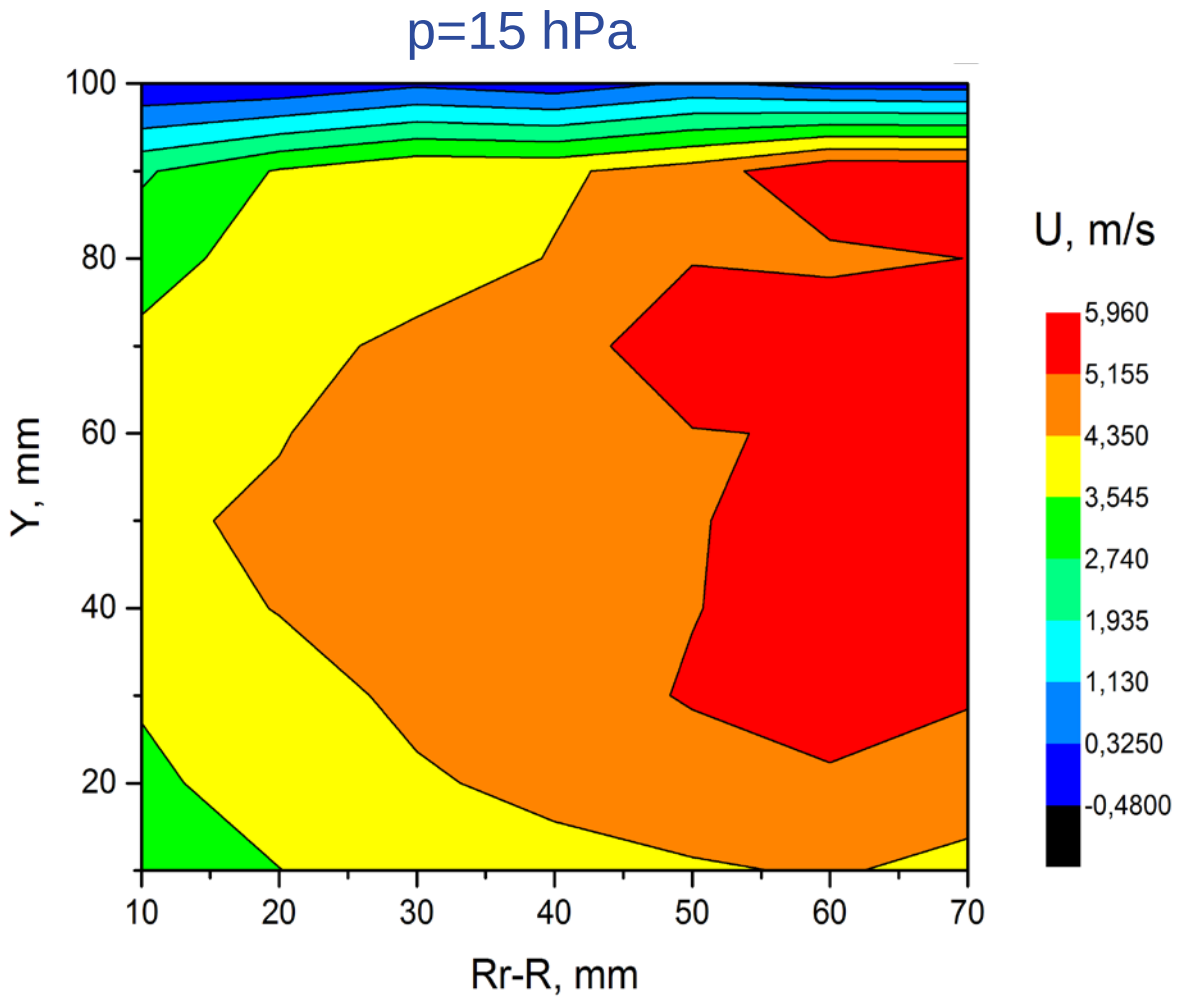
Lead Centre cooperation

- MORGANE campaign La Reunion May 2015 (talk S. Evan)
- Vaisala
  - Software testing
  - Discussion GRUAN interface
- GFZ Potsdam, development GNSS data product. AMT paper by Ning et al. (DOI: 10.5194/amt-9-79-2016)
- ETH Zürich, StratoClim Campaign
- CAO Moscow, FLASH-B instrument

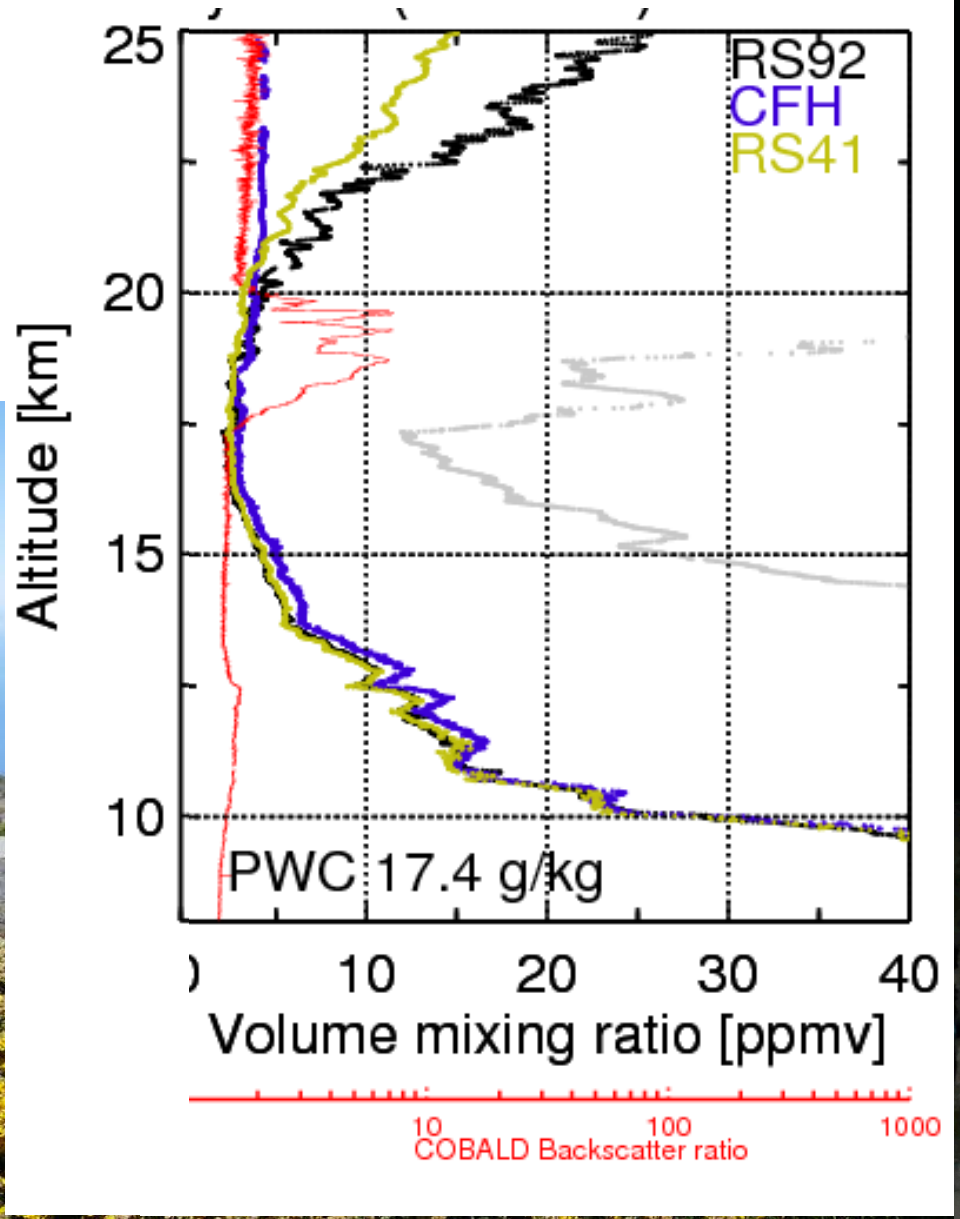
Determine flow pattern in radiation-test chamber

- Laser Doppler anemometry

(Ch. von Rohden Wednesday morning)



LC cooperation: La Reu



Software development

- RsLaunchClient
  Running without problems

- GRUAN data processor version 3 in preparation. (presentation Tuesday afternoon)

Radiosonde characterisation

Extensive research program for RS41

Laboratory experiments (radiation, calibration, time lag)

Dual soundings with RS41/RS92 and CFH

GRUAN data reports

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

Detail

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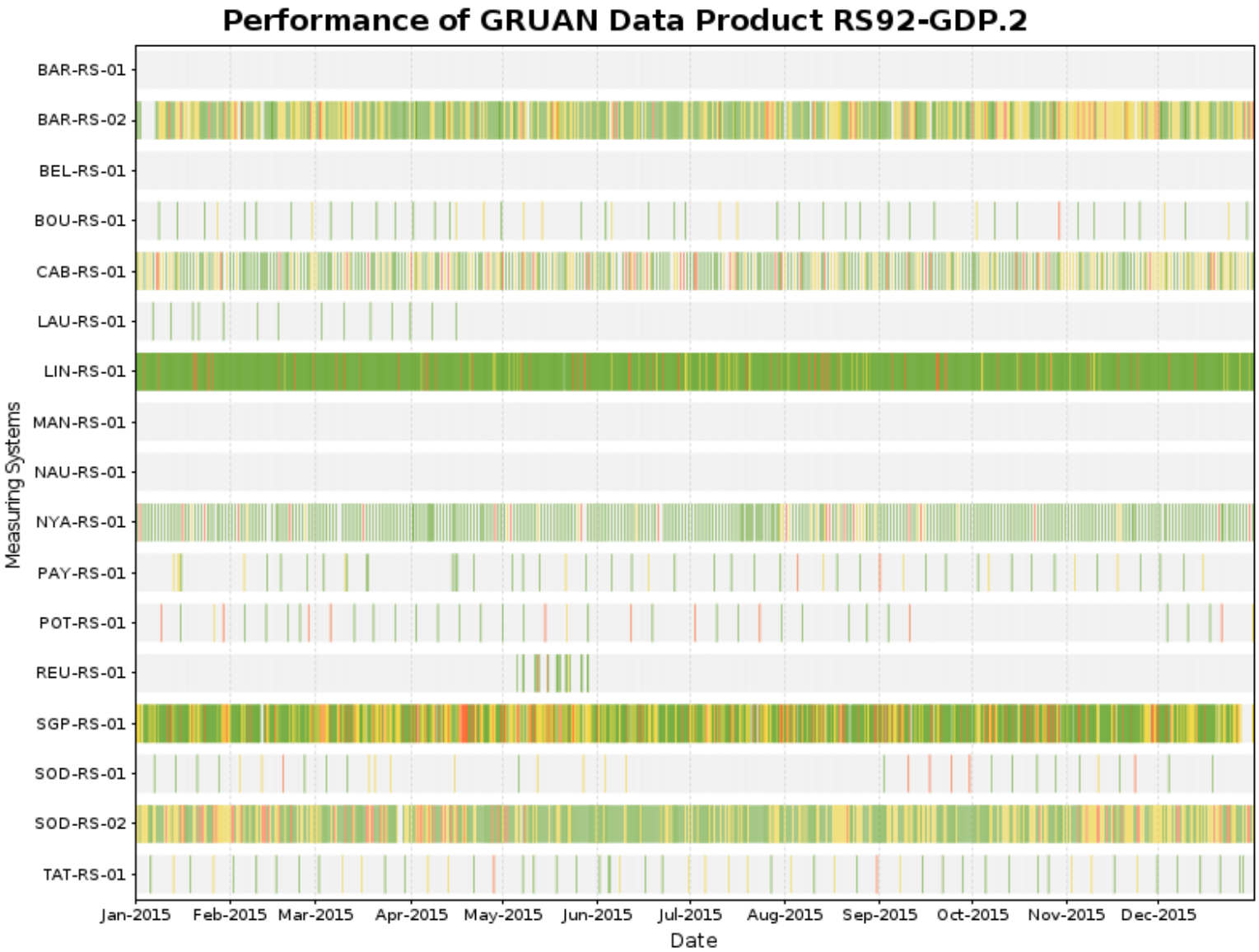


Achievements

- LC-funded cooperation with GFZ to develop GNSS data product (Start: March 2015)
- Data stream Tateno (RS-11G) established
- Numerous GRUAN-related papers (15) and presentations

GRUAN-related papers in 2015/2016

Bodeker, G. E., et al., Reference upper-air observations for climate: From concept to reality, BAMS, 97, 123–135, doi:10.1175/bams-d-14-00072.1, 2016.

Kräuchi, A., et al., Controlled weather balloon ascents and descents for atmospheric research and climate monitoring, AMT, 9(3), 929–938, doi:10.5194/amt-9-929-2016, 2016.

Ning, T., et al., The uncertainty of the atmospheric integrated water vapour estimated from GNSS observations, AMT, 9(1), 79–92, doi:10.5194/amt-9-79-2016, 2016.

Trickl,T.,et al., How stratospheric are deep stratospheric intrusions? LUAMI 2008, ACPD, 2016, 1–44, doi:10.5194/acp-2016-264, 2016.

Vömel, H., et al., An update on the uncertainties of water vapor measurements using Cryogenic Frostpoint Hygrometers, AMTD, 2016, 1–26, doi:10.5194/amt-2016-44, 2016.

GRUAN-related papers in 2015/2016

Antón, M., et al., Validation of GOME-2/MetOp-A total water vapour column using reference radiosonde data from GRUAN network, AMT, 8(3), 1135–1145, doi:10.5194/amt-8-1135-2015, 2015.

Bodeker, G. E. et al., Techniques for analyses of trends in GRUAN data, AMT, 8(4), 1673–1684, doi:10.5194/amt-8-1673-2015, 2015.

Butterfield, D. et al., Determining the temporal variability in atmospheric temperature profiles measured using radiosondes and assessment of correction factors for different launch schedules, AMT, 8(1), 463– 470, doi:10.5194/amt-8-463-2015, 2015.

Ignaccolo, R., et al., Modelling collocation uncertainty of 3d atmospheric profiles, Stochastic Environmental Research and Risk Assessment, 29(2), 417–429, doi:10.1007/s00477-014-0890-7, 2015, ISSN 1436-3240.

Jensen, M. P., et al., Comparison of Vaisala radiosondes RS41 and RS92 at the ARM Southern Great Plains Site, AMTD, 8(11), 11,323–11,368, doi:10.5194/amtd-8-11323-2015, 2015.

GRUAN-related papers in 2015/2016

Kreher, K., et al., An objective determination of optimal site locations for detecting expected trends in upper-air temperature and total column ozone, ACP, 15(13), 7653–7665, doi:10.5194/acp-15-7653-2015, 2015.

Ladstädter, F., et al., Climate intercomparison of GPS radio occultation, RS90/92 radiosondes and GRUAN over 2002 to 2013, AMT, 8(4), 1819–1834, doi:10.5194/amt-8-1819-2015, 2015.

Musacchio,C.,et al., Arctic metrology: calibration of radiosondes groundcheck sensors in Ny-Ålesund,Meteorological Applications, 22, 854–860, doi:10.1002/met.1506, 2015, ISSN 1469-8080.

Sairanen, H., et al., Validation of a calibration set-up for radiosondes to fulfil GRUAN requirements, Measurement Science and Technology, 26(10), 105,901, 2015.

Yu, H., et al., Evaluation of humidity correction methods for Vaisala RS92 tropical sounding data, J. Atmos. Ocean. Technol., 32(3), 397–411, doi:10.1175/jtech-d-14-00166.1, 2015.

GRUAN presentations

Work on new data products

Vaisala radiosondes (Lead Centre)

Meisei radiosonde (Kizu)

Meteolabor Radiosonde (Philipona)

Modem Radiosonde (Haeffelin)

Frostpoint (Vömel)

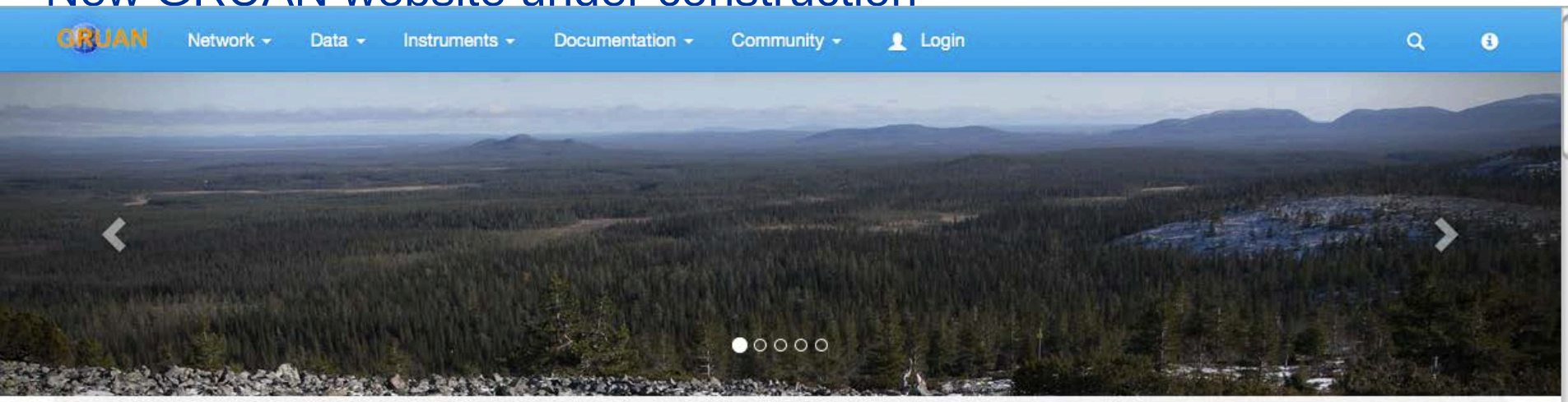
GNSS (Lead Centre & GFZ)

Lidar (Leblanc)

MWR (Cimini)

GRUAN website

New GRUAN website under construction



GRUAN

The Global Climate Observing System (GCOS) Reference Upper-Air Network (GRUAN) is an international reference observing network, designed to fill an important gap in the current global observing system. GRUAN measurements will provide long-term, high-quality climate data records from the surface, through the troposphere, and into the stratosphere. These will be 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

Various

Schulz & Partner

- Redesigned SHC can be ordered, price ~2800 euro
- Adapters for RS41, RS92, M10, etc ~250 euro

New GRUAN website

http://beta.gruan-online.org

user: icm8

password: Boulder2016

(Presentation by M. Sommer on Friday)

Questions

CAB
LIN
PAY
GRUAN
Certified Site
Sodankylä
Finland
Operated by FMI
The Certification is based on the GRUAN measurement RS92 GRUAN Data Product (RS92-GDP)
GRUAN Lead Centre
Lindenberg, Germany
GCOS
GLOBAL CLIMATE OBSERVING SYSTEM