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Session 7

GRUAN Site Report for Potenza

(Submitted by Fabio Madonna)

Summary and Purpose of this Document

Report from the GRUAN site Potenza for the period January to December 2018.

Overview

Currently, only radiosounding data are provided to the GRUAN data archive. Two launches per week are routinely performed since November 2018. For GNSS data, CNR is waiting for a feedback from GFZ to start submitting the GNSS data to GRUAN from the two antennas operating at the site (Trimble and Novatel). A new autolauncher and a spare manual sounding system will become available in the next year along with a new Raman lidar for aerosol and water vapour and a new microwave profiler.

Change and change management

Since November 2018, twice launches per week are performed (on Monday and Thursday, typically, about 30-60 minutes after the sunset using the manual station (including the use of the SHC in the launch procedure). The autolauncher is not operated and will be replaced by a new version within the next 12 months.
RS41 are routinely used for the weekly launches.
Analysis of the comparison experiment between RS92 and RS41 radiosondes performed using the climatic chamber Kambic KK-105 and, in cooperation with INRiM, using a wind tunnel is in progress and the outcome will be reported at the next ICM.
GNSS-RO overpasses are taken in consideration and, when not very demanding for the personnel involved in the radiosonde launches, a few launches have been performed accordingly.
No changes in data processing algorithms, data acquisition software, location of instruments, and operating environments of instruments must be reported.
The description of Potenza site on the GRUAN web page has been updated providing also new photos of the instruments and of the facility.

Resourcing

Potenza is continuing to support GRUAN activities using not dedicated funds. Nevertheless as announced last year, the Potenza site has been acknowledged as an IT-relevant infrastructure; this has allowed to be funded for the replacement of the old autolauncher system and to buy a spare manual system. Moreover, the available funding allows to ensure 2 launches per week for the next three years with potential additional resources to measure stratospheric water vapour, once recommendations in this sense will be provided by the LC. It must be also noted that Potenza has started working with the LC to become the fail safe backup for the full GRUAN data archive.

Operations

No operational challenges or deviations from GRUAN procedures must be noted for the Potenza site. The international crisis in the supply of helium for balloon filling fostered very preliminary discussion on the possibility to use hydrogen in the future. The use of hydrogen is technically feasible at Potenza station, though there are some bureaucratic steps to face.

Site assessment and certification

Potenza site has been certified on 29 April 2015 and the site may be ready to go through the certification process during 2019. However, it is important to point out that the station will undergo a major update in 2019 and 2020, which will allow to increase the support to GRUAN mission.

GRUAN-related research

- CNR is leading the C3S 311a Lot3 contract of the Copernicus Climate Change Service (C3S) for the harmonization of GRUAN and IGRA radiosounding historical data archives. GRUAN reference data and harmonized IGRA data have been already provided to C3S and will become soon available to the public though the Climate Data Store (CDS). The harmonization algorithm is described in two publications under preparation.

- In the contribution to TT measurement scheduling and combination, CNR has investigated the impact of temporal and spatial subsampling of radiosonde measurements on the calculation of trends; the results will be summarized at the next ICM and are part of a publication under preparation.

- CNR has recently undertaken the leadership of the data analysis and the writing of the manuscript to describe the performance of the automatic radiosonde launchers and to discuss their use within GRUAN.

Publications:

- F. Finazzi, A. Fassò, F. Madonna, I. Negri, B. Sun, M. Rosoldi, Statistical harmonization and uncertainty assessment in the comparison of satellite and radiosonde climate variables, Environmetrics 30 (2), e2528, 2019.

- Fassò A., F. Finazzi, F. Madonna, Statistical issues in radiosonde observation of atmospheric tem-perature and humidity profiles, Statistics & Probability Letters 136, 97-100, 2018, `https://doi.org/10.1016/j.spl.2018.02.027`.

WG-GRUAN interface

Nothing to consider. The procedure to obtain the WIGOS ID has been completed, but a final official confirmation from the Met Service has not been provided yet, with the consequent permission to transmit data to the WIS.

Items for ICM-11 plenary discussions

- Stratospheric water vapour measurements
- Establishment of other GRUAN products (GNSS primarily with a concrete timeline, Raman lidar, and MWR with possible interaction with other initiatives, such as E-PROFILE)
- Use of autolaunchers within GRUAN
- Funding calls for GRUAN research activities on climate research and satellite validation

Other archiving centers

Referring strictly to those dataset relevant for GRUAN: GNSS data are also archived on the RING (Italian Integrated GPS network) aerosol and clouds are available via ACTRIS data portal (`actris.nilu.no`)

Participation in campaigns

No campaigns relevant for GRUAN research activities must be reported

Future plans

Potenza station will acquire several new instruments within 2019 and 2020. Specifically for GRUAN, a new autolauncher will be available, a spare manual sounding system, a new Raman lidar for aerosol and water vapour, a new microwave profiler. In addition, an existing GNSS antenna will installed as a permanent station and a new Doppler wind lidar has been recently installed and, after testing, will measure on a routine basis. The research activities mentioned above will continue with the publication of results in peer-reviewed literature.

GRUAN Site Report for Potenza (POT), 2018

Reported time range is Jan 2018 to Dec 2018
Created by the Lead Centre
Version from 2019-05-09

1 General GRUAN site information

Object	Value
Station name	Potenza
Unique GRUAN ID	POT
Geographical position	40.6000 °N, 15.7200 °E, 720.0 m
Operated by	IMAA | Istituto di Metodologie per l'Analisi Ambientale, part of: CNR | Consiglio Nazionale delle Ricerche
Main contact	Madonna, Fabio
WMO no./name	-
Operators	currently 4, changes +1 / -0
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
POT-GN-01	GNSS Site TITO	GNSS	0	not operational
POT-RS-01	Potenza Radiosonde Launch Site	Sounding Site	5	42

1.2 General comments from Lead Centre

No comments available from Lead Centre.

2 System: GNSS Site TITO (POT-GN-01)

Object	Value
System name	GNSS Site TITO
Unique GRUAN ID	POT-GN-01
System type	GNSS (GN - GNSS)
Geographical position	40.6013 °N, 15.7237 °E, 818.2 m
Operated by	IMAA | Istituto di Metodologie per l'Analisi Ambientale, part of: CNR | Consiglio Nazionale delle Ricerche
Instrument contact	Madonna, Fabio
Started at	-
Defined setups	-
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

No GNSS dataflow to GRUAN LC as yet.

3 System: Potenza Radiosonde Launch Site (POT-RS-01)

Object	Value
System name	Potenza Radiosonde Launch Site
Unique GRUAN ID	POT-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	40.6010 °N, 15.7237 °E, 760.0 m
Operated by	IMAA | Istituto di Metodologie per l'Analisi Ambientale, part of: CNR | Consiglio Nazionale delle Ricerche
Instrument contact	Madonna, Fabio
Started at	-
Defined setups	5 (OZONE, ROUTINE, ROUTINE2, RESEARCH, ROUTINE3)
Possible streams	ECC, RS41, RS92

3.1 Lead Centre comments

3.1.1 Dataflow

Sonde dataflow to GRUAN LC is operational since February 2011.

3.1.2 General

Routine soundings are performed one time per week with Vaisala RS41-SG.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI

3.2.1 Stream: RS41

RS41		42	42	
RS41-RAW	001		42	
RS41-EDT	001		42	
RS41-GDP-ALPHA	002		37	

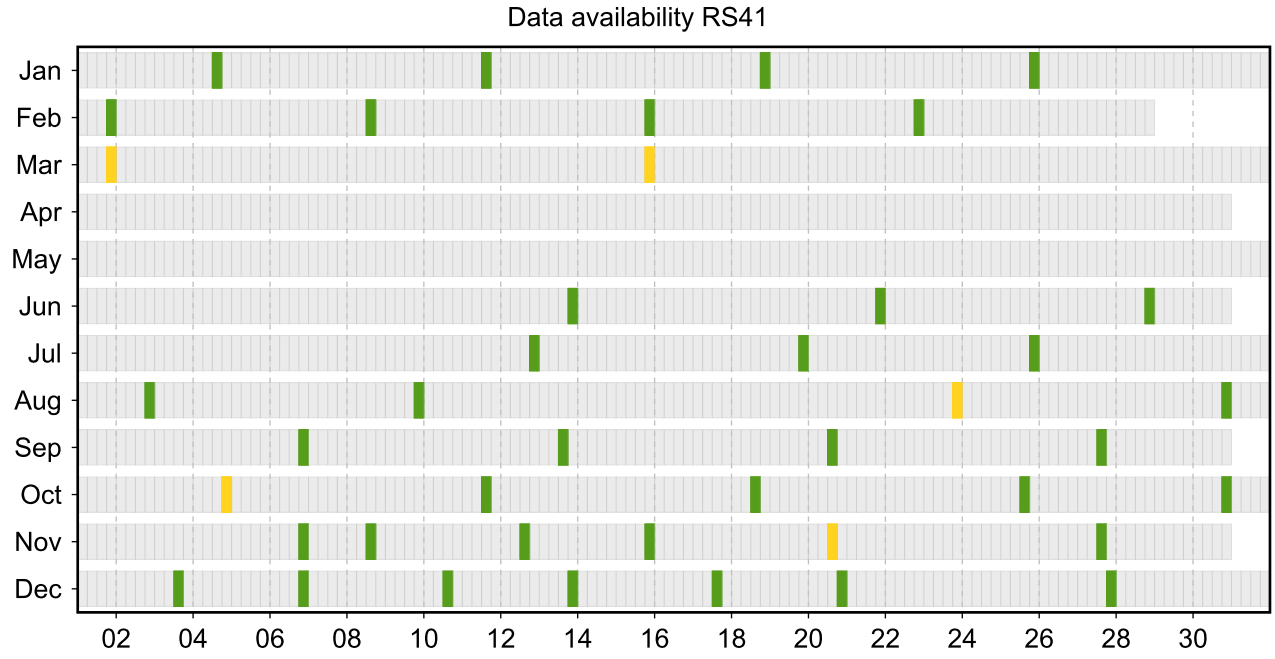
3.3 Data availability of data products

Available (green): All steps of processing have been successfully completed. The data file is available at LC (e.g. unapproved or uncertified GRUAN data products) and at NCEI (approved and certified GRUAN data products).

Unprocessed (yellow): The raw data file has been successfully converted to a GRUAN standardized raw data file format (NetCDF). The processing (e.g. GRUAN data processing) has not yet been done, or has not been completed. Reason may be a processing routine which does not yet exist, or software errors.

Original (red): The original raw data file is available (e.g. MWX). The raw data file was not converted to a GRUAN standardized raw data file format (NetCDF). Reason may be a converting routine which does not yet exist, or a corrupt original raw data file, or software errors.

3.3.1 Stream: RS41



3.5 Instrument combinations of POT-RS-01

Count	Instrument combination
42	RS41

3.6 Instrument ground check

3.6.1 Stream: RS41

(1) GroundCheck: GC-SHC

3.7 Measurement events