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Session 1

GRUAN Site Report for Graciosa

(Submitted by Evan Keeler)

Summary and Purpose of this Document

Report from the GRUAN site Graciosa for the period January to December 2019.

Overview

The ARM Eastern North Atlantic (ENA) site in Graciosa, Portugal operated two Vaisala MW41 manual launch systems during 2019. The systems are designated C1 and S01. Both manual launch systems share a single UHF-GPS antenna set. ENA conducts 2 flights per day, launching at 00Z and 12Z. These flights are primarily conducted with the C1 system, however the site has the capability to do dual launches. All flight data is sent to the ARM Data Archive for processing and distribution.

Change and change management

The site continues its normal operational launches described above as well as supporting the JPSS program. Phase 8 of the JPSS program continued through the end of 2019 with plans for phase 8 to end in 2020. Phase 9 will be started in 2020.

Resourcing

Currently at ENA intends to continue launching standard ARM radiosondes without changes to the schedule while continuing support of research projects. Resourcing needs have been identified for the burstpoint at or above 10 hPa and the 100 % humidity chamber. ARM needs a request with suffi-cient scientific justification to make these changes to the sites.

Operations

The operations concerns at ENA are the need to modify the operations to include the 600g balloons to consistently reach 10mb and the incorporation of the 100 % humidity chamber. However, this is more of a resourcing issue to provide the justification needed for ARM to make this change. The purchase of the 100 % humidity chamber needs to be revisited, the last investigation reported that individual units could not be sold.

Site assessment and certification

Graciosa certification status will require an internal review of ENAs capability to maintain certification. ARMs focus is bringing SGP up to requirements and certifying NSA once Autosonde requirements are outlined.

GRUAN-related research

In 2019 the ENA site continued its support of the following field campaigns with Lori Borg as the Principal Investigator:

- ARM Radiosondes for Joint Polar Satellite System (JPSS) Validation Field Campaign
  - https://www.osti.gov/servlets/purl/1526023

Support for the JPSS campaign continued through 2019 at ENA. In 2020 funding will run out for phase 8 and phase 9 will begin.

WG-GRUAN interface

ARM will need to provide sufficient scientific justification for the incorporation and purchasing of 600mb balloons and the 100 % humidity chamber into ENA operations. ARM will continue to work with the GURAN working group to monitor the literature and put forward the justification for this change.

Other archiving centers

ARM data is placed only in the ARM Data Archive.
https://www.archive.arm.gov/discovery/

Participation in campaigns

All ARM field campaign information is available on the ARM website at:
https://www.arm.gov/research/campaigns
Most supported field campaigns request radiosonde launches to support the targeted research.

Future plans

In 2020 Evan Keeler will be replacing Donna Holdridge as the radiosonde mentor. The ENA site will continue to support the JPSS radiosonde launches. The ENA will also continue the 2 operational launches per day.
ARM will continue to operate radiosonde launches in arctic locations in the MOSAIC campaign. The ARM Mobile Facility 2 (AMF2) will be aboard the Polarstern. AMF1 will be in Andøya Island, Norway, NSA in Utqiagvik, AK.

All Sonde computer systems will be upgraded to windows 10 in 2020. This will require all MW41 software to be updated to 2.16.

SGP, ENA, and NSA plan to continue radiosonde operations at the current schedule. ARM will operate radiosonde launches in arctic locations during and in the MOSAIC campaign. The ARM Mobile Facility 2 (AMF2) will be aboard the Polarstern, AMF1 will be in Andøya Island, Norway, NSA in Utqiagvik, AK, and AMF3 in Oliktok, AK will be in their current locations.

GRUAN Site Report for Graciosa (GRA), 2019

Reported time range is Jan 2019 to Dec 2019
Created by the Lead Centre
Version from 2020-11-05

1 General GRUAN site information

Object	Value
Station name	Graciosa
Unique GRUAN ID	GRA
Geographical position	39.0911 °N, -28.0266 °W, 30.5 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Main contact	Keeler, Evan
WMO no./name	-
Operators	currently 0, changes +0 / -0
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
GRA-GN-01	GNSS site ENAO	GNSS	1	operational
GRA-RS-01	Balloon-Borne Sounding System (SONDE) at Graciosa	Sounding Site	4	777

1.2 General comments from Lead Centre

1.2.1 General

ARM employs an automated procedure to transmit raw and processed measurement data.

ARM is kindly requested to inform the Lead Centre of any (upcoming) changes in equipment, launch schedule, or procedures so that the metadata database can be kept up-to-date.

2 System: GNSS site ENAO (GRA-GN-01)

Object	Value
System name	GNSS site ENAO
Unique GRUAN ID	GRA-GN-01
System type	GNSS (GN - GNSS)
Geographical position	39.0528 °N, -28.0134 °W, 91.9 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	2019-07-15
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC and to the GRUAN GNSS processing centre at GFZ has started in July 2019. The current dataflow includes manufacturer raw data, converted raw data (RINEX), instrument logs, and processed data.

The operational processing as GNSS-PW-GDP is performed.

3 System: Balloon-Borne Sounding System (SONDE) at Graciosa (GRA-RS-

Object	Value
System name	Balloon-Borne Sounding System (SONDE) at Graciosa
Unique GRUAN ID	GRA-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	39.0911 °N, -28.0266 °W, 30.5 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	2009-04-16
Defined setups	4 (ROUTINE, ROUTINE2, ROUTINE3, DUAL)
Possible streams	RS41, RS92

3.1 Lead Centre comments

3.1.1 Dataflow

Dataflow is running fully automated from the ARM Archive to the GRUAN LC. Launch metadata are not checked manually. Equipment changes (e.g. balloon, unwinder, …) are not recorded.

As a consequence it is essential that the Lead Centre is notified of all upcoming changes to be able to maintain a correct metadata record. (This comment applies to all ARM sites in GRUAN.)

Change of operational sonde from Vaisala RS92-SGP to Vaisala RS41-SG was on 12 January 2019.

Additional launches from the 'RIVAL' field campaign are included in the dataflow until March 2019.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
3.2.1 Stream: RS41				
RS41		755	755	
RS41-RAW	001		755	
RS41-EDT	001		753	
RS41-GDP-ALPHA	001		98	
RS41-GDP-ALPHA	002		597	
RS41-GDP-ALPHA	003		263	
RS41-GDP-ALPHA	004		8	
RS41-GDP-BETA	001		264	
3.2.2 Stream: RS92				
RS92		30	30	
RS92-INT	001		30	
RS92-RAW	002		30	
RS92-EDT	001		30	
RS92-GDP	002		29	

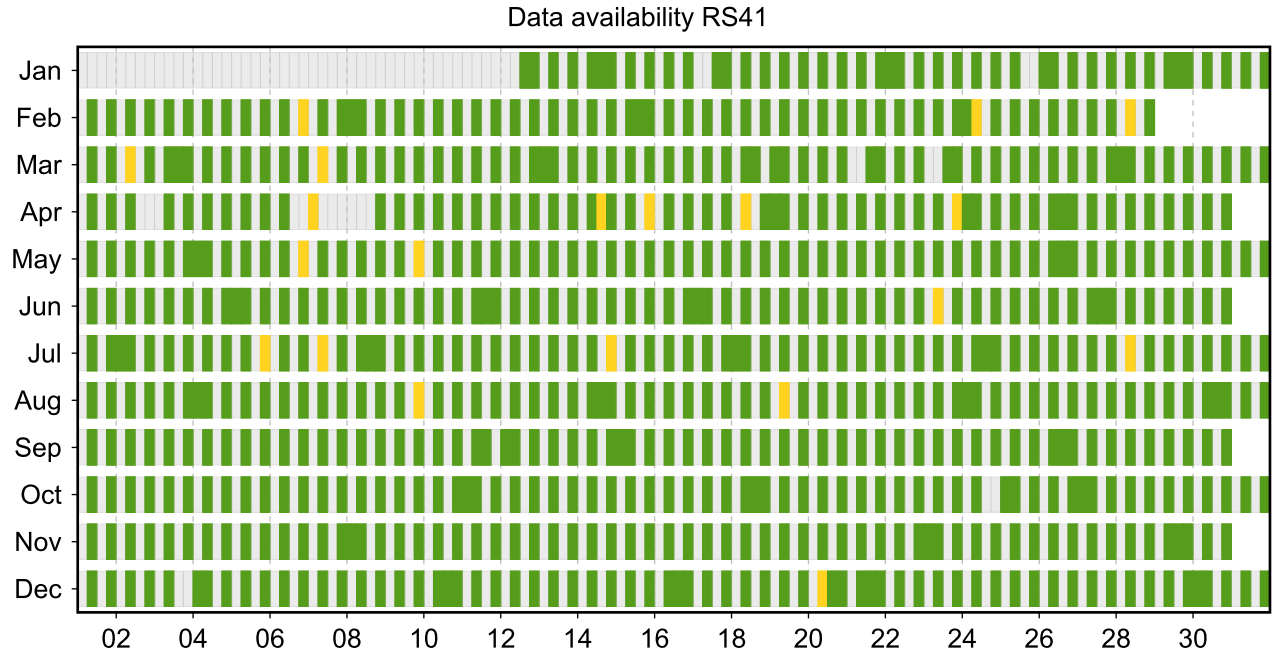
3.3 Availability of data products

Available (green): All steps of data processing have been successfully completed. The data product file is available at LC (e.g. files that didn't pass QA/QC or uncertified GRUAN data products) and/or at NCEI (a certified GRUAN data product file that did pass QA/QC).

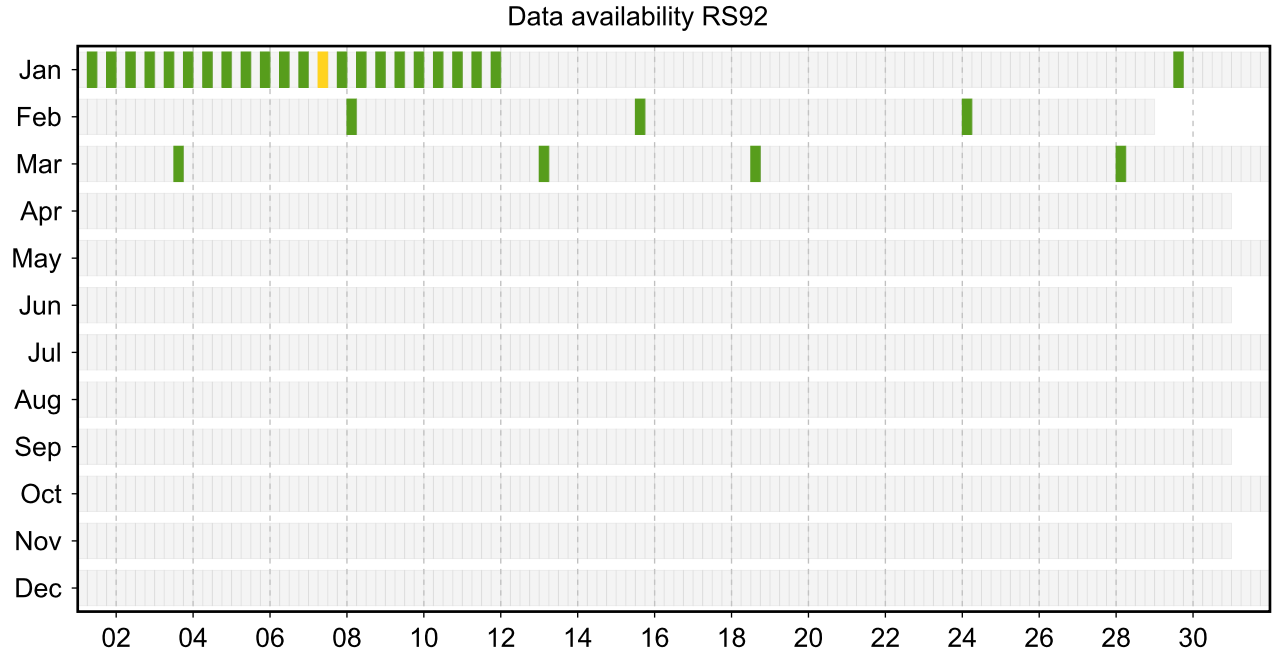
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software error.

Original (red): The original, manufacturer-produced, raw data file is available (e.g. MWX data file) but was not converted into a GRUAN-standardized raw data format (NetCDF). Reasons for this may be missing data conversion software, a software error, or a corrupt data file.

3.3.1 Stream: RS41



3.3.2 Stream: RS92



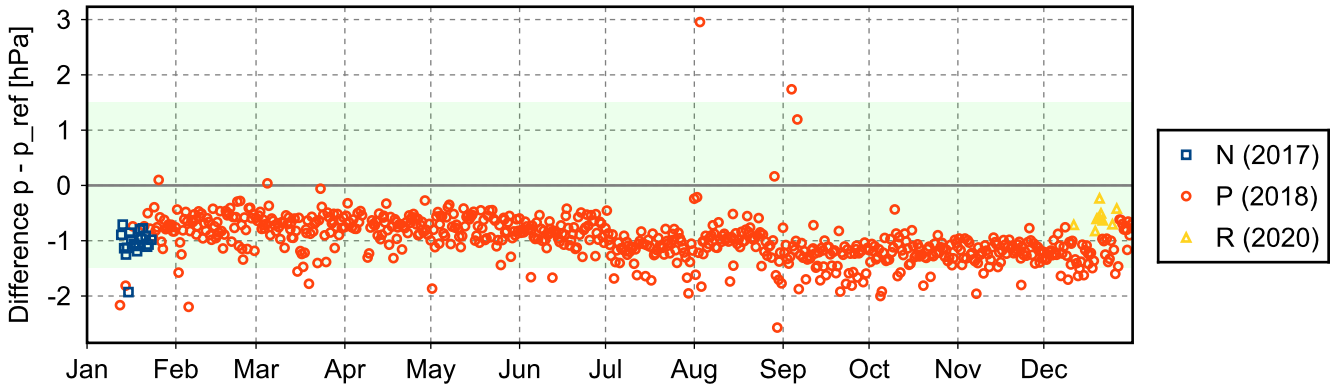
3.4 Instrument combinations of GRA-RS-01

Count	Instrument combination
747	RS41
8	RS41, RS92
22	RS92

3.5 Instrument ground check

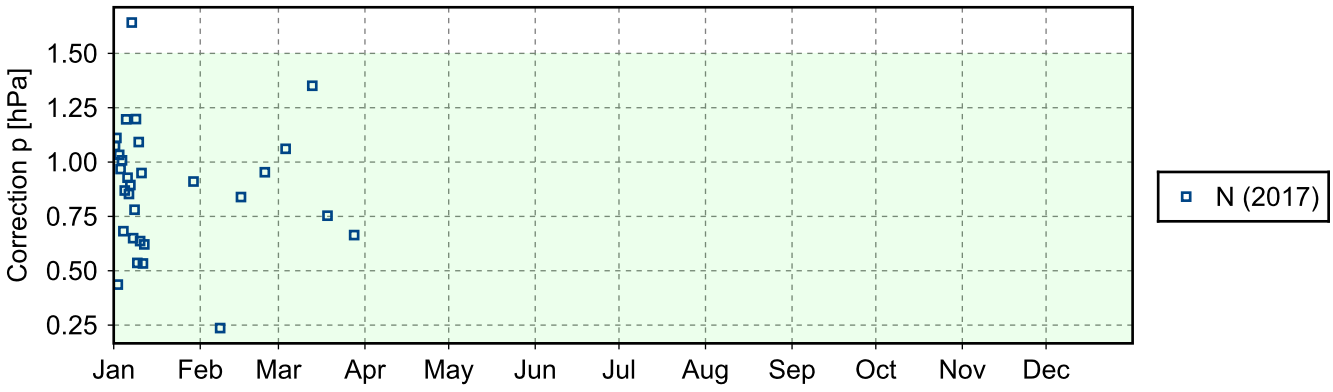
3.5.1 Stream: RS41

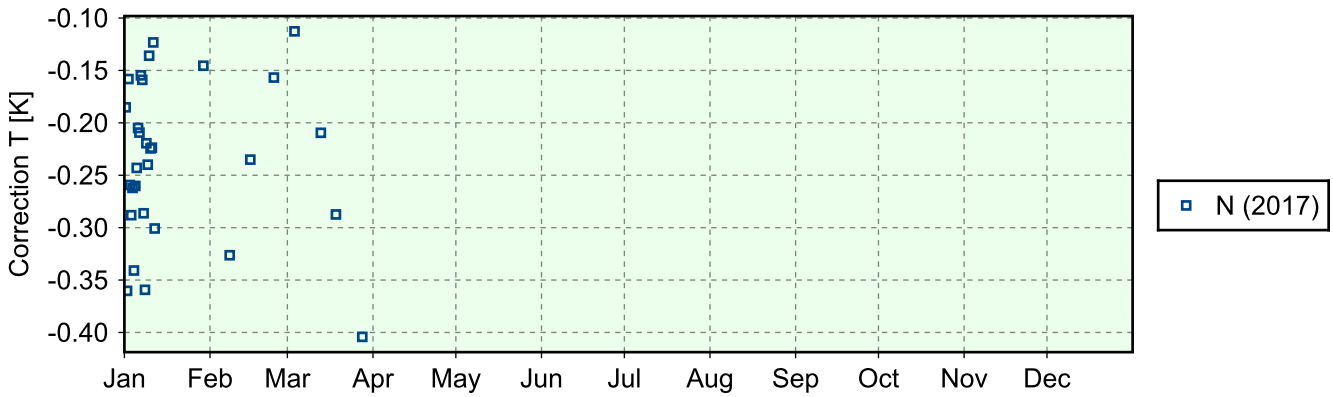
(1) GroundCheck: GC-RI41

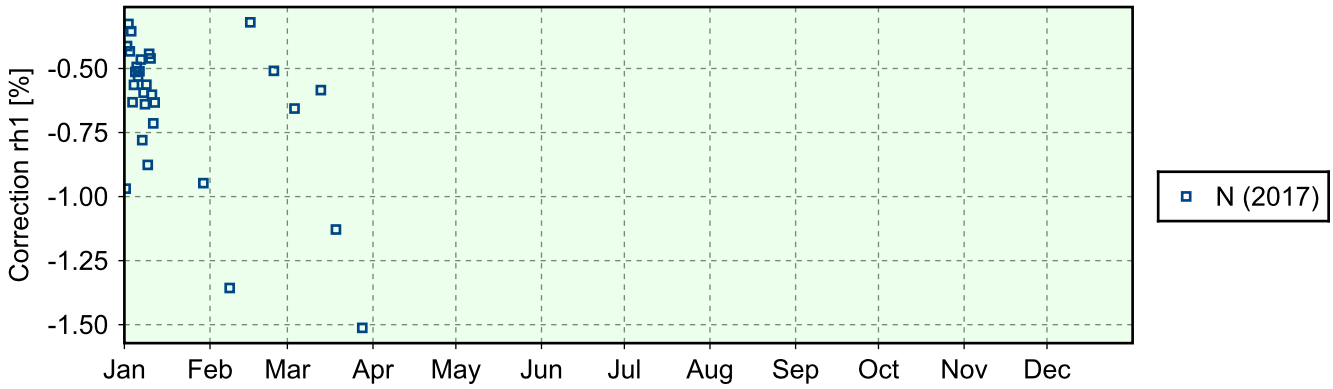


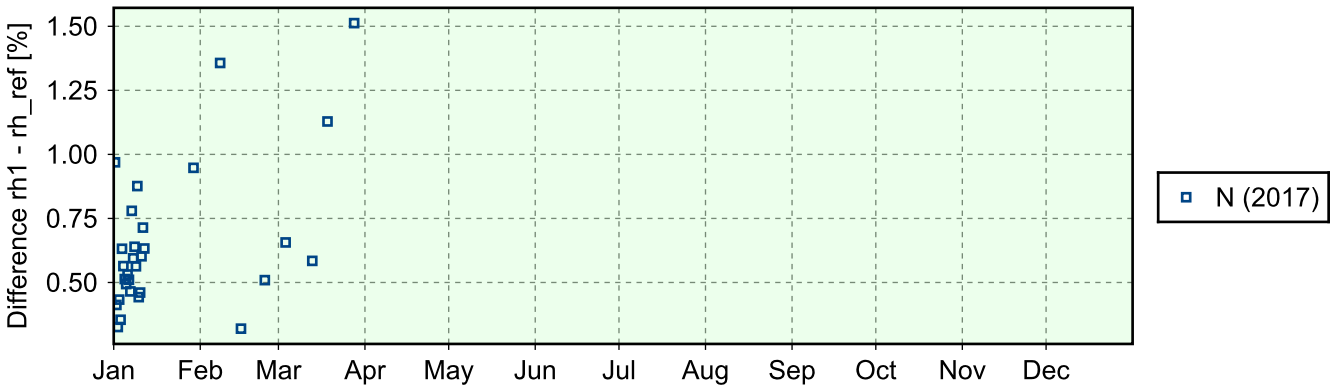
3.5.2 Stream: RS92

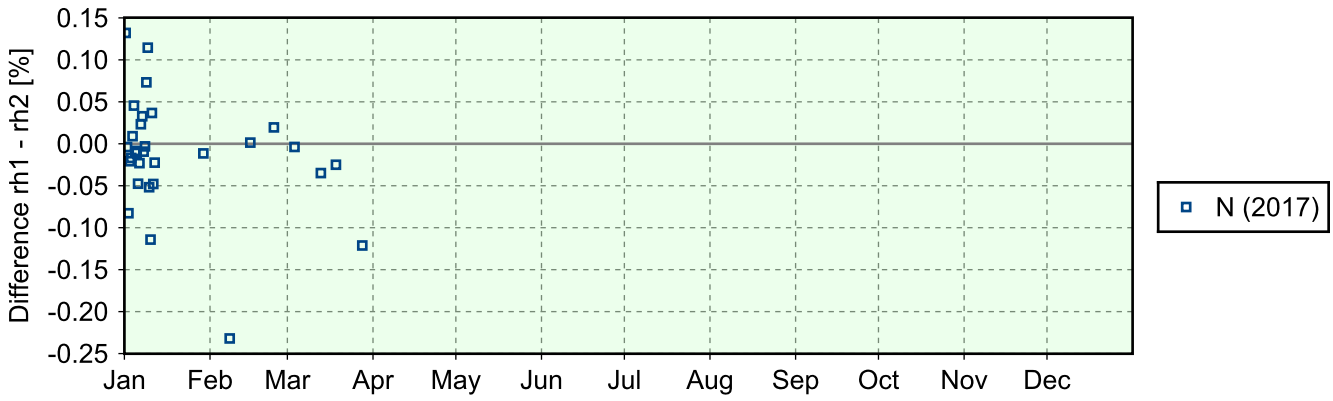
(1) GroundCheck: GC-GC25











3.6 Measurement events