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GLOBAL CLIMATE OBSERVING SYSTEM (GCOS)

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Session 1

GRUAN Site Report for Lamont

(Submitted by Evan Keeler)

Summary and Purpose of this Document

Report from the GRUAN site Lamont for the period January to December 2020.

Overview

The ARM Southern Great Plains (SGP) site near Lamont, Oklahoma operated three Vaisala MW41 manual launch systems during 2020. The systems are designated C1, S01, and S02. SGP conducts 4 flights per day, launching at 00Z, 06Z, 12Z, and 18Z. These flights are primarily conducted with the C1 system, however when the need arises for a dual flight the other systems will be used. All flight data is sent to the ARM Data Archive for processing and distribution.

Change and change management

No major changes have been made to how the SGP conducts operations since 2018. The site continues its normal operational launches described above. The site is continuing its support of the JPSS/RIVAL program. Phase 9 of the JPSS/RIVAL program began with the first coordinated launch at Lamont, IL with an overpass on September 30th, 2020.

In 2020 Evan Keeler has replaced Donna Holdridge as the ARM manager for all Radiosonde operations.

In the Fall of 2020 all ARM computers were upgraded to windows 10. This involved replacing older PC hardware where needed.

All ARM Vaisala sounding stations were upgraded to software version 2.16 in 2020.

Resourcing

Currently at SGP ARM intends to continue launching standard ARM radiosondes without changes to the schedule. Resourcing needs have been identified for the burstpoint at or above 10 hPa and the 100 % humidity chamber.

Operations

The operations concern at SGP are the need to modify the operations to include the 600g balloons to consistently reach 10mb and the incorporation of the 100 % humidity chamber. Sufficient scientific justification has been identified and a request will be put forward in 2021 for the larger 600g balloons. The purchase of the 100 % humidity chamber needs to be revisited, the last investigation reported that individual units could not be sold.

COVID-19

The SGP site experienced several disruptions due to the COVID-19 pandemic. Because the site has higher traffic than the other ARM sites more restrictions were put into place involving on-site personnel. Dual radiosonde launches for the RIVAL campaign could not be completed initially until staff were trained to conduct these launches while socially distancing. Several launches were missed due to limited staff on-site.

Site assessment and certification

SGP has been certified and maintains that certification.

GRUAN-related research

In 2020 the SGP site continued its support of the following field campaigns with Lori Borg as the Principal Investigator for both:

- ARM: Radiosonde Intercomparison & VALidation (RIVAL)
  - `https://armweb0-stg.ornl.gov/research/campaigns/sgp2017rival`
- ARM Radiosondes for Joint Polar Satellite System (JPSS) Validation Field Campaign
- `https://www.osti.gov/servlets/purl/1526023`

Support for both campaigns continued through 2020 at SGP.

WG-GRUAN interface

The working group has been able to supply sufficient documentation to put forth a request for 600g balloons in 2021.

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.

The ARM radiosonde program will be heavily involved in the upcoming TRACER campaign, supplying 4 Vaisala ground stations to the campaign.

Future plans

The SGP site will continue to support the JPSS/RIVAL radiosonde launches in 2021. The SGP site will also continue launching 4 radiosondes per day operationally.

A deficiency has been noted across all of the ARM sites involving the burst height not consistently reaching 10mb. A request will be put forward in 2021 to ARM management to begin utilizing 600g balloons in place of the 350g balloons we currently use. This request will be supported by the evidence supplied by other members of the GRUAN community.

Investigation into the purchase of SHC manufacturer-independent ground check will be completed.

GRUAN Site Report for Lamont (SGP), 2020

Reported time range is Jan 2020 to Dec 2020
Created by the Lead Centre
Version from 2021-04-27

1 General GRUAN site information

Object	Value
Station name	Lamont
Unique GRUAN ID	SGP
Geographical position	36.6000 °N, -97.4900 °W, 320.0 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Main contact	Keeler, Evan
WMO no./name	74646 LAMONT
Operators	currently 1, changes +0 / -0
Sounding Site	1
GNSS	1

1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
SGP-GN-01	GNSS Site SGPO	GNSS	1	operational
SGP-RS-01	Balloon-Borne Sounding System (SONDE) at Lamont	Sounding Site	5	1317

1.2 General comments from Lead Centre

1.2.1 General

ARM employs an automated procedure to transmit raw 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.

It is strongly recommended to use a manufacturer independent ground check (e.g. SHC) for the Vaisala radiosonde.

2 System: GNSS Site SGPO (SGP-GN-01)

Object	Value
System name	GNSS Site SGPO
Unique GRUAN ID	SGP-GN-01
System type	GNSS (GN - GNSS)
Geographical position	36.6041 °N, -97.4848 °W, 290.0 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	-
Defined setups	1 (HOURLY)
Possible streams	-

2.1 Lead Centre comments

2.1.1 Dataflow

Measurements are recorded at station since December 2018.

Dataflow of GNSS data to GRUAN LC and the GRUAN GNSS processing centre at GFZ has started in December 2018. The current dataflow includes manufacturer raw data, converted raw data (RINEX) and instrument logs, containing all equipment changes.

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

3 System: Balloon-Borne Sounding System (SONDE) at Lamont (SGP-RS-01)

Object	Value
System name	Balloon-Borne Sounding System (SONDE) at Lamont
Unique GRUAN ID	SGP-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	36.6100 °N, -97.4900 °W, 315.0 m
Operated by	ARM | US DOE Atmospheric Radiation Measurement (ARM) Program
Instrument contact	Keeler, Evan
Started at	-
Defined setups	5 (ROUTINE, DUAL, CFH, ROUTINE2, ROUTINE3)
Possible streams	CFH, 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.)

Routine soundings are performed four times a day using Vaisala RS41-SGP. A few soundings with RS92 are performed.

A regular measurement program for the observation of stratospheric water vapor could not be performed using CFH (because the pandemic). No data flow of CFH flights is established. An appropriate solution should be found in cooperation between site (instrument mentor) and LC.

3.1.2 General

Recommended burst altitude of 10 hPa is not reached on a regular basis.

3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
3.2.1 Stream: RS41				
RS41		1312	1312	
RS41-GCA	001		1311	
RS41-RAW	001		1312	
RS41-EDT	001		1312	
RS41-GDP-ALPHA	003		362	
RS41-GDP-ALPHA	004		239	
RS41-GDP-BETA	001		1309	
RS41-GDP-BETA	002		245	
3.2.2 Stream: RS92				
RS92		5	5	
RS92-INT	001		5	
RS92-RAW	002		5	
RS92-EDT	001		5	
RS92-GDP	002		1	

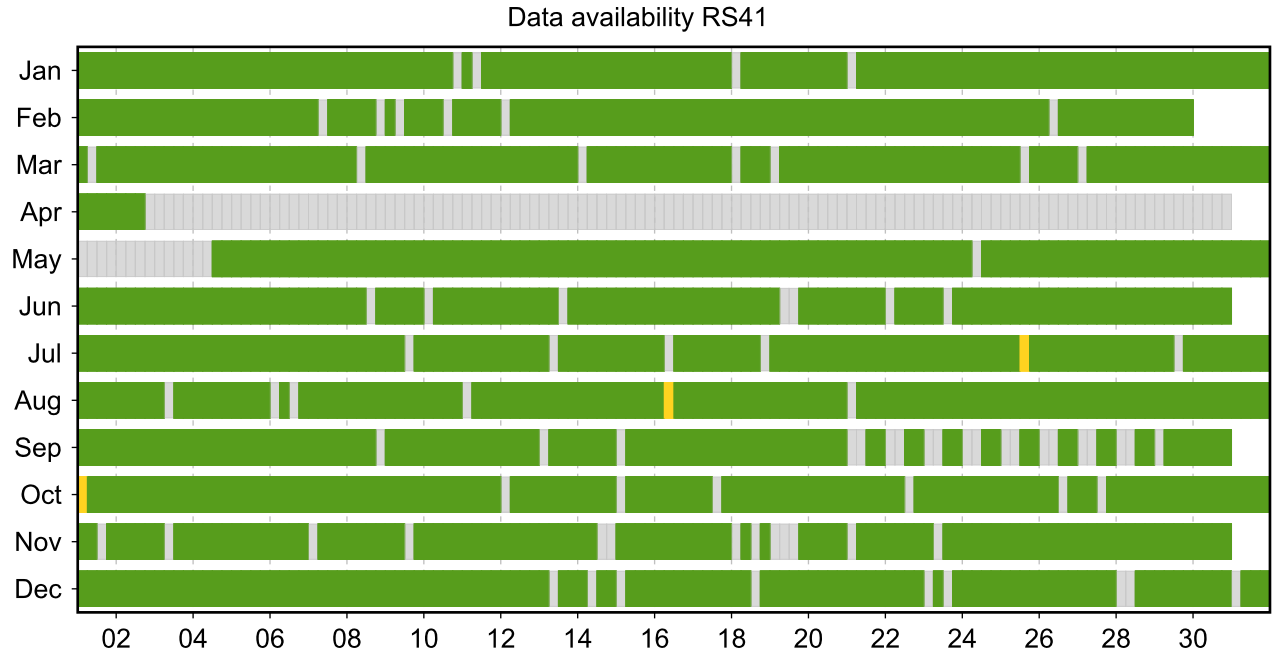
3.3 Availability of data products

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).

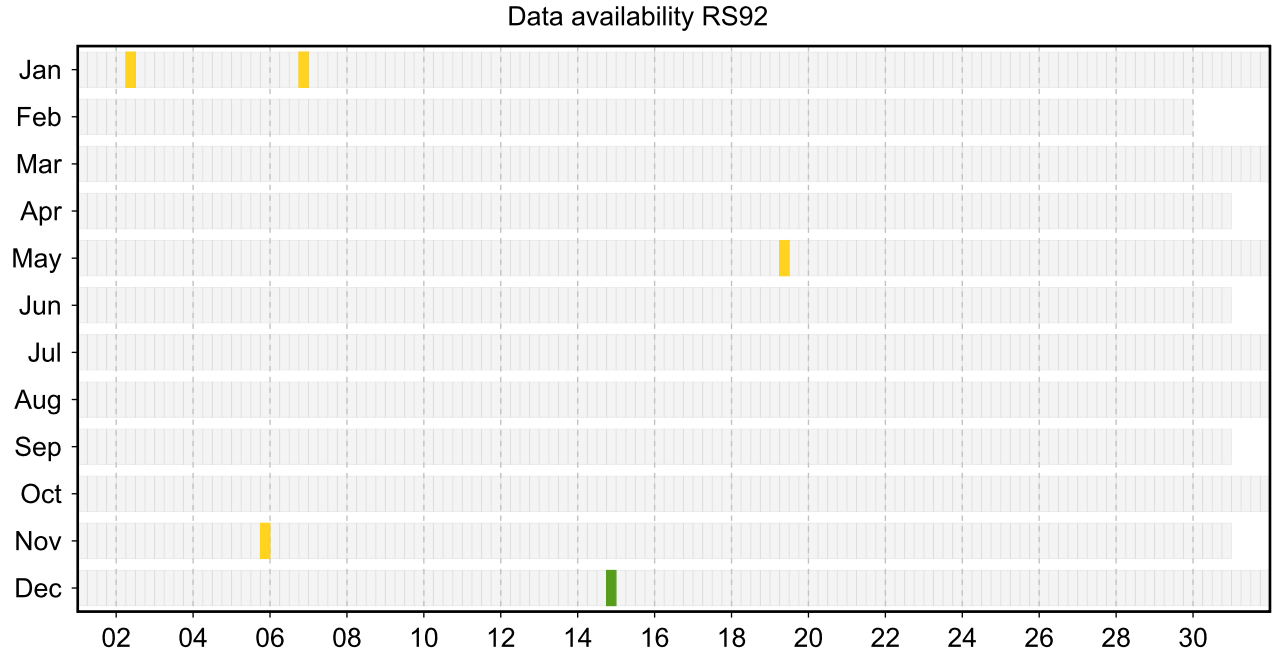
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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



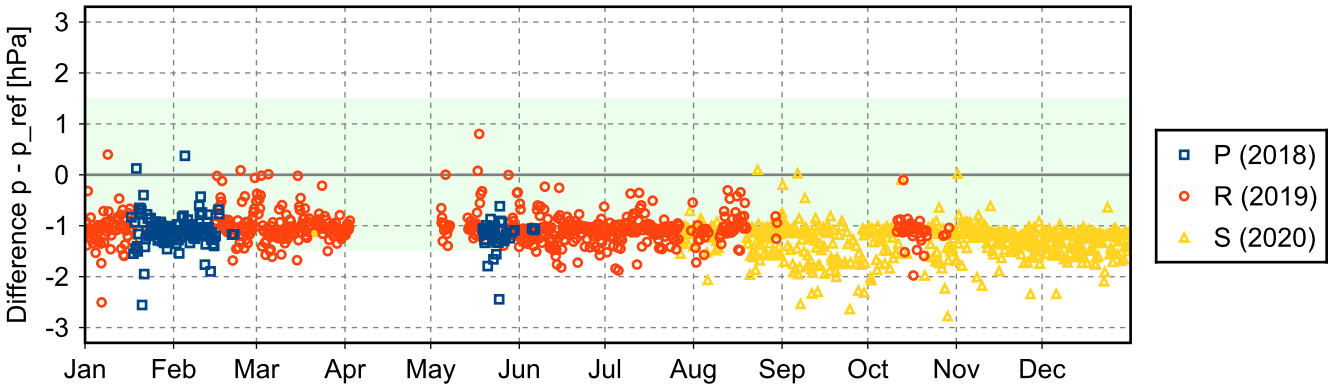
3.4 Instrument combinations of SGP-RS-01

Count	Instrument combination
1312	RS41
5	RS92

3.5 Instrument ground check

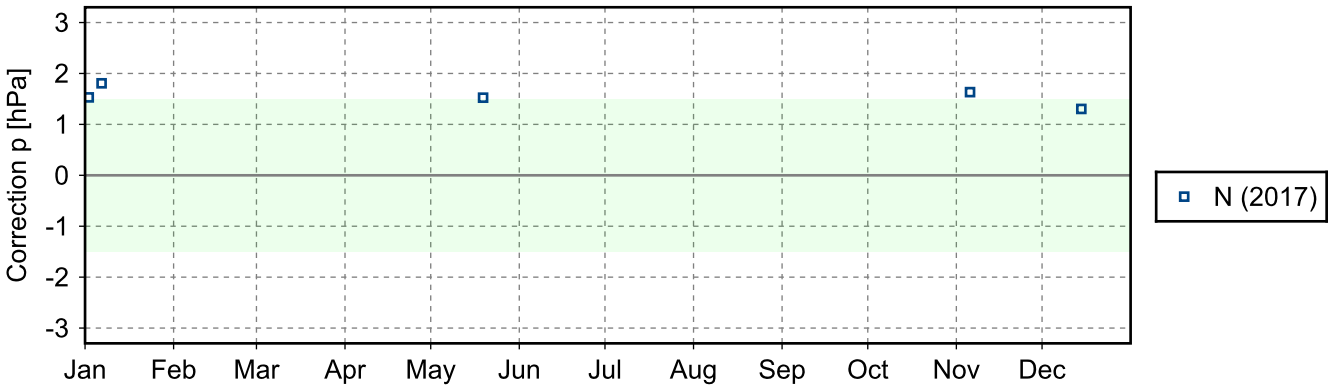
3.5.1 Stream: RS41

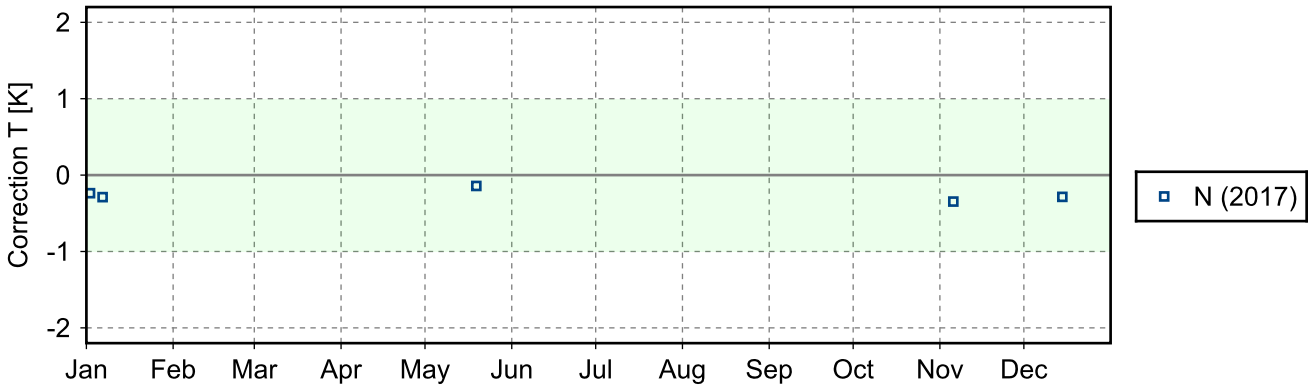
(1) GroundCheck: GC-RI41

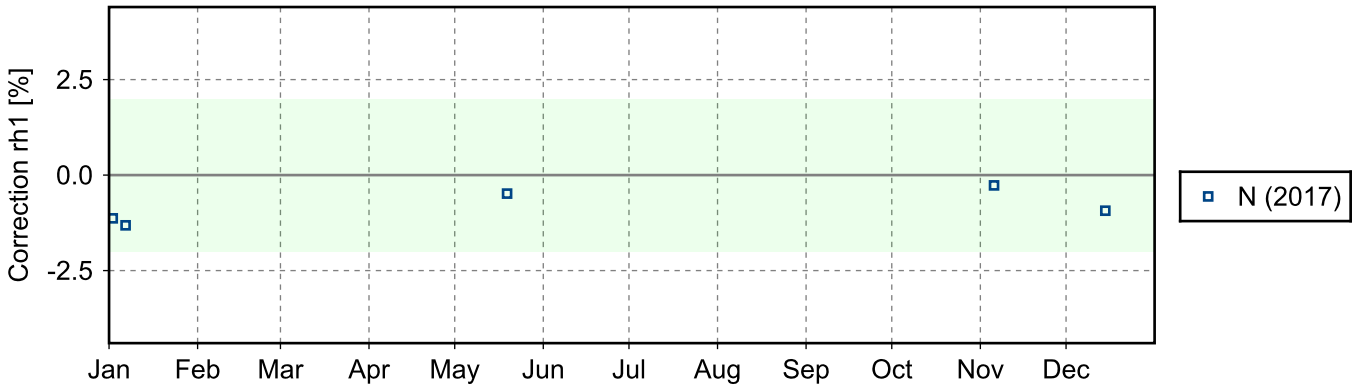


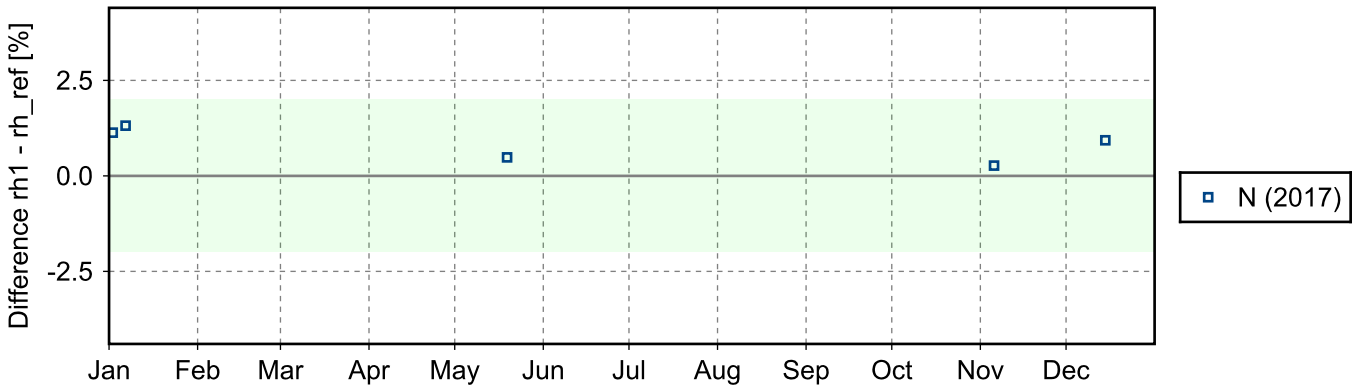
3.5.2 Stream: RS92

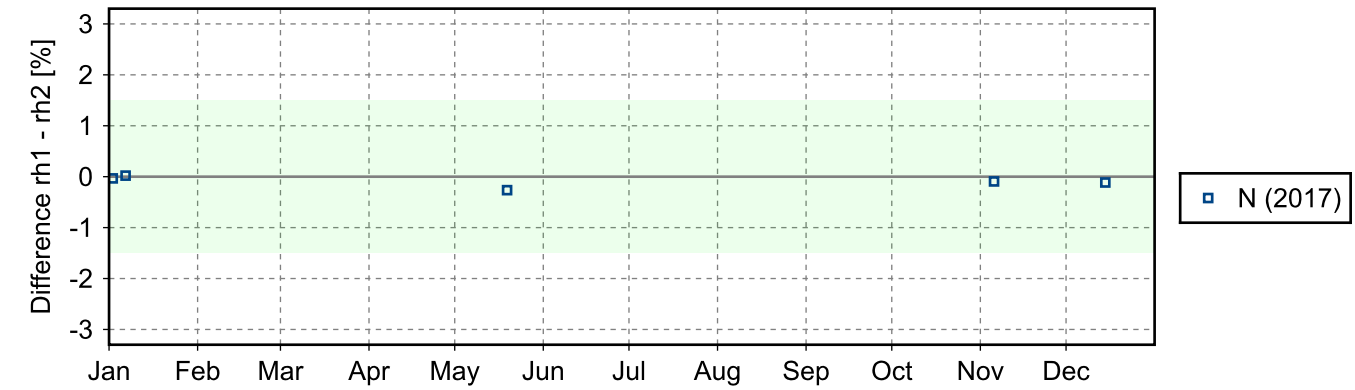
(1) GroundCheck: GC-GC25











3.6 Measurement events