



WMO/IOC/UNEP/ICSU  
GLOBAL CLIMATE OBSERVING  
SYSTEM (GCOS)

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**12th GRUAN Implementation-  
Coordination Meeting (ICM-12)**

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Session 1

Virtual

16 - 20 November 2020

## GRUAN Site Report for Lamont

*(Submitted by Evan Keeler)*

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### **Summary and Purpose of this Document**

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

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## **Overview**

The ARM Southern Great Plains (SGP) site near Lamont, Oklahoma operated three Vaisala MW41 manual launch systems during 2019. 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 JPSSRIVAL program. Phase 8 of the JPSSRIVAL 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 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. ARM needs a request with sufficient scientific justification to make these changes to the sites.

## **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. 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**

SGP has been certified and maintains that certification.

## GRUAN-related research

In 2019 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 2019 at SGP. 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 SGP operations. ARM will continue to work with the GRUAN 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 SGP site will continue to support the JPSS and RIVAL radiosonde launches. The SGP will also continue the 4 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.



# GRUAN Site Report for Lamont (SGP), 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	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	1854

### 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-SG. Once a week a sounding with RS92 is performed.

The dataflow includes additional RS92-RS41 twin soundings performed in the framework of the RIVAL campaign (until April 2019).

A regular measurement program for the observation of stratospheric water vapor was performed using CFH. No data flow of CFH flights is established. An appropriate solution should be found in cooperation between site (instrument mentor) and LC.



## 3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
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### 3.2.1 Stream: RS41

RS41		1805	1805	
RS41-RAW	001		1805	
RS41-EDT	001		1804	
RS41-GDP-ALPHA	001		232	
RS41-GDP-ALPHA	002		1486	
RS41-GDP-ALPHA	003		499	
RS41-GDP-ALPHA	004		13	
RS41-GDP-BETA	001		500	

### 3.2.2 Stream: RS92

RS92		62	62	
RS92-INT	001		62	
RS92-RAW	002		62	
RS92-EDT	001		62	
RS92-GDP	002		25	

### 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).

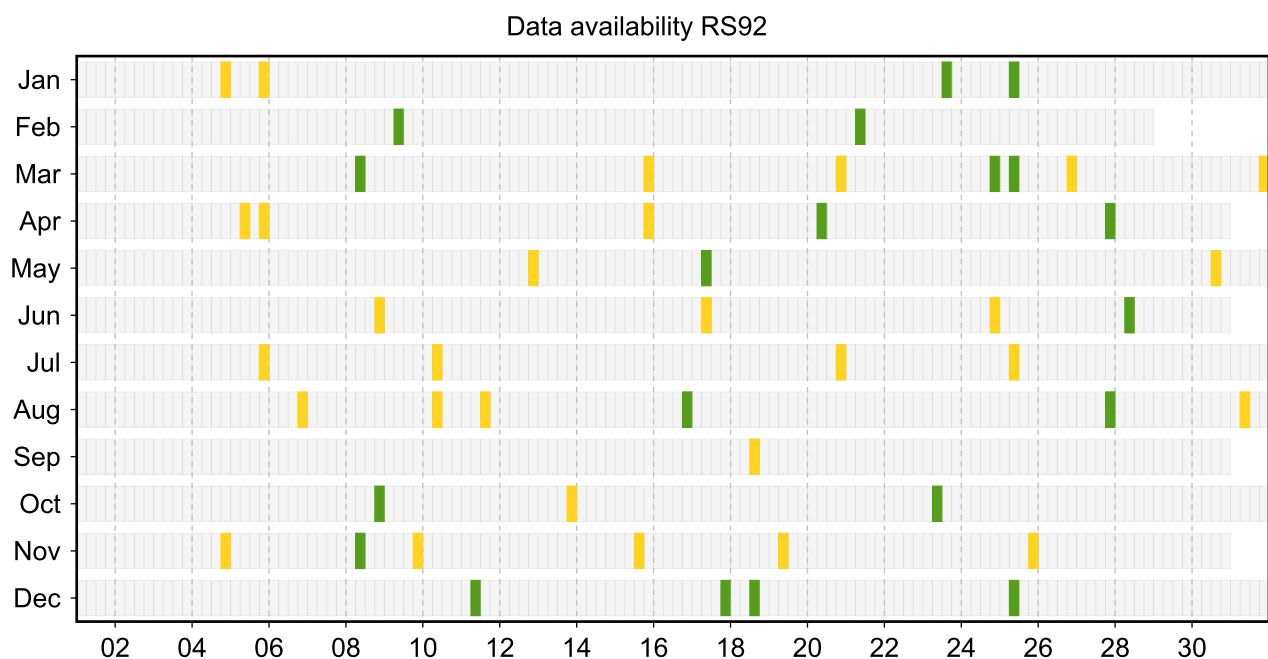
Unprocessed (yellow): The manufacturer-produced file with raw measurement data has been successfully converted into a GRUAN-standardized raw data format (NetCDF). The GRUAN data processing has not been performed or was aborted. Reasons for this may be a still missing GRUAN data processor or a processing-software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



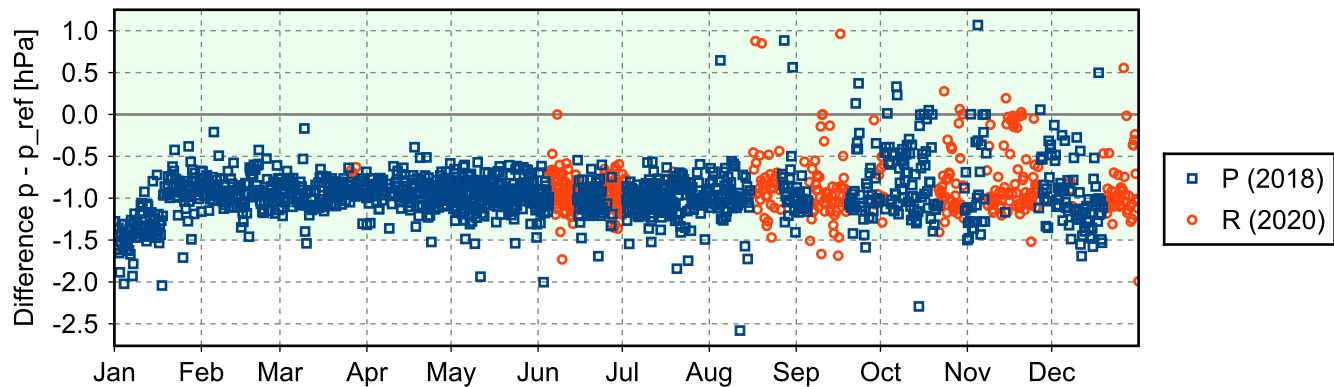
### 3.4 Instrument combinations of SGP-RS-01

Count	Instrument combination
1792	RS41
13	RS41, RS92
49	RS92

### 3.5 Instrument ground check

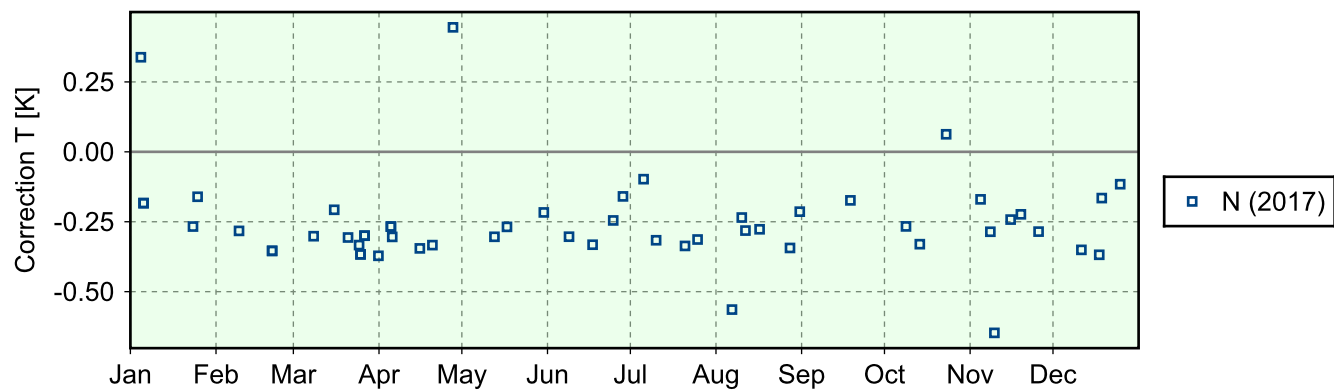
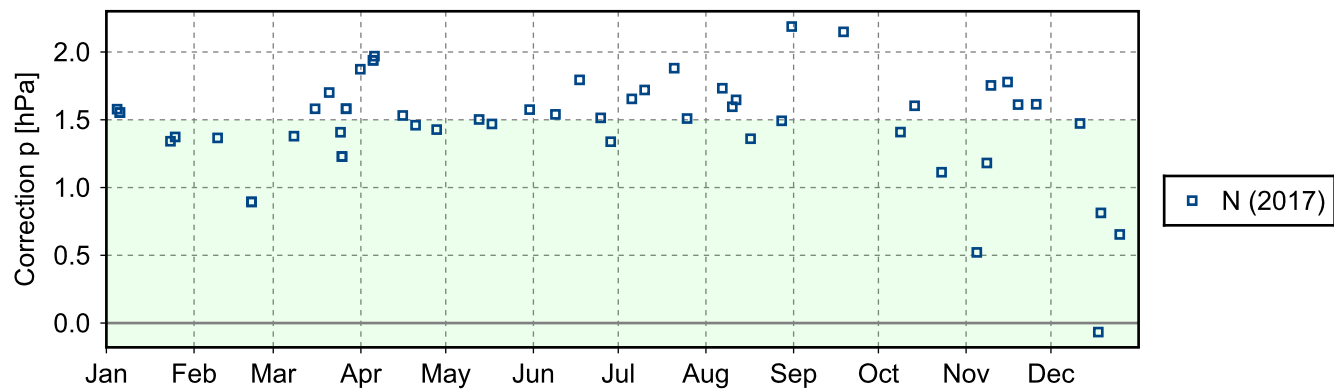
#### 3.5.1 Stream: RS41

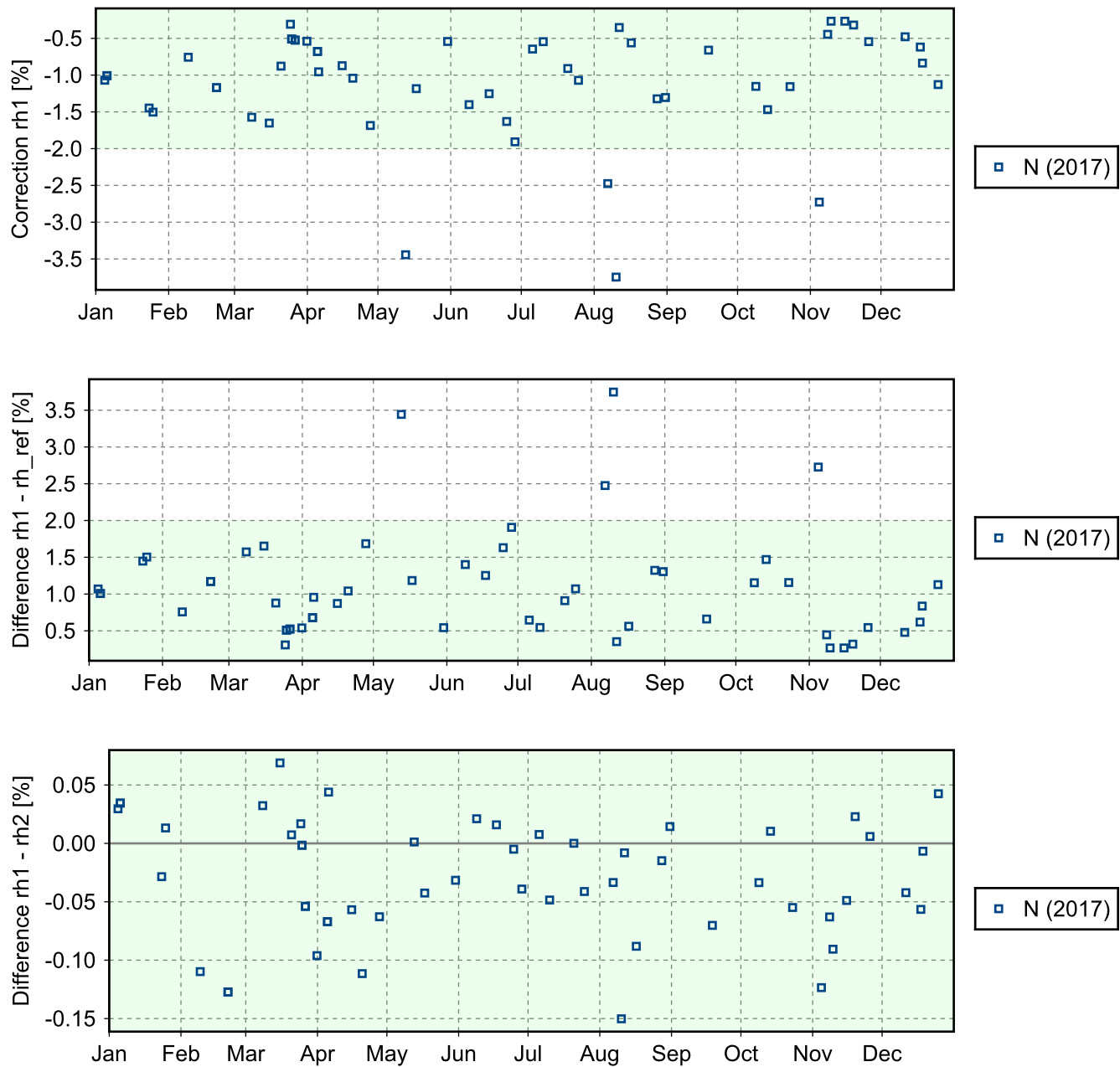
**(1) GroundCheck: GC-RI41**



#### 3.5.2 Stream: RS92

**(1) GroundCheck: GC-GC25**





3.6 Measurement events

