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**11th GRUAN Implementation-  
Coordination Meeting (ICM-11)**

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Session 7

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## GRUAN Site Report for Payerne

*(Submitted by Giovanni Martucci)*

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

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

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## Overview

Consolidated measurement programmes:

- The RS92 radiosounding program continues at Payerne since 2005 (since 2011 data are submitted to the Lead Centre).
- The multi-payload comparison programme (RS41, RS92, SRS-C34, SRS-C50) has been continued during the entire 2018.
- Till March 2018, the Vaisala RS41 has been flying irregularly every week (roughly alternated daytime and night-time).

New measurement programmes:

- Starting from April 2018 the Vaisala RS41 replaced the SRS-C50 as the operational sonde at Payerne. The change has involved also the launching procedure: the RS41 are launched every midnight, weekend (noon and midnight) and official holidays (noon and midnight) automatically by the Vaisala AS15 Autosonde system.
- Operational flights with the Vaisala RS41 are launched manually every day of the week at noon and when the ozone sonde (three times per week) is launched together with the RS41 (independent of the time of launch).

GRUAN new product:

- Operational Raman lidar for temperature, humidity and aerosols. Continuous operation since 2008 with 50% data availability on average. Night time measurements cover UTLS region.

## Change and change management

Measurement changes (as stated above):

- Starting from April 2018 the Vaisala RS41 replaced the SRS-C50 as the operational sonde at Payerne. The change has involved also the launching procedure: the RS41 are launched every midnight, weekend (noon and midnight) and official holidays (noon and midnight) automatically by the Vaisala AS15 Autosonde system
- Staff changes

## Resourcing

Personnel:

- During the transition phase June 2017-Aug 2018 Dr. Dominique Ruffieux has replaced ad interim Dr. Rolf Philipona. During the same period MeteoSwiss Payerne has been involved in a major change, i.e. the transition from the sonde provider Meteolabor (SRS-C50) to the Vaisala system RS41 for operational launches. Due to this transition, MeteoSwiss has accumulated a temporary delay in the data transfer to the Lead Centre. Currently, all automatic radiosounding data have been sent retroactively to the Lead Centre.
- Staff changes: since September 2018 Dr. Giovanni Martucci has been appointed GRUAN site manager for Payerne. Rolf Philipona left MeteoSwiss in 2017 and his position has not been renewed. Dominique Ruffieux left MeteoSwiss in 2018, his successor as Head of Atmospheric Data Division is Alexander Haeefele.

Funding:

- The funding are of governmental origin and stable.

## Operations

Due to the change from manual to automatic sounding, and to the delay that the transition caused to our operations, the procedure to send the data to the Lead Centre of all the manual and multi-payload flights has not been finalized yet.

## Site assessment and certification

Site recertification is under review by the Lead Centre

## GRUAN-related research

Task Team participation:

- Gonzague Romanens and Christian Felix, MeteoSwiss, are members of the GRUAN TT Radiosondes with the task to report on auto-launcher performances and GRUAN-compatibility.
- Giovanni Martucci is member of the GRUAN TT Ancillary under the specific task of LIDAR activities.

List of in-preparation/submitted/published GRUAN-related scientific publications:

- Giovanni Martucci, Francisco Navas-Guzmán, Valentin Simeonov, Ludovic Renaud, and Alexander Haefele. Validation of one-year of temperature data by the Raman Lidar for Meteorological Observations (RALMO) at Payerne, in preparation.
- Navas-Guzmán, F., Martucci, G., Collaud Coen, M., Hervo, M. and Haefele, A.: Continuous monitoring of aerosol hygroscopicity by Raman lidar measurements at the EARLINET station of Payerne. Atmospheric Chemistry and Physics, in preparation.
- Farhani, G., Sica, R. J., Godin-Beekmann, S., and Haefele, A.: Optimal Estimation Method Retrievals of Stratospheric Ozone Profiles from a DIAL Lidar, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2018-310>, in review
- Hicks-Jalali, S., Sica, R. J., Haefele, A., and Martucci, G.: Calibration of a Water Vapour Lidar using a Radiosonde Trajectory Method, Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2018-246>, in review.
- Jalali, A., Sica, R. J., and Haefele, A.: Improvements to a long-term Rayleigh-scatter lidar temperature climatology by using an optimal estimation method, Atmos. Meas. Tech., 11, 6043-6058, <https://doi.org/10.5194/amt-11-6043-2018>, 2018.
- Christian Félix, Gonzague Romanens, Giovanni Martucci. Feasibility study for automated GRUAN radiosoundings, poster presentation P1\_25, WMO CIMO TECO-2018 conference, 8-11 Oct 2018, Amsterdam, NL.

## WG-GRUAN interface

We wonder if the operational programme of the RS41 could be regarded as official GRUAN flights.

## Items for ICM-11 plenary discussions

- LIDAR product contribution to the GRUAN programme of water vapour and temperature measurement in the UT and LS
- The compatibility of radiosounding automatization related to GRUAN requirements should be addressed.

## Other archiving centers

- EARLINET
- NDACC

## Participation in campaigns

None for the reporting period

## Future plans

- The measurement programme detailed at point 1 will be continued in 2019.
- MeteoSwiss will fly between January and December 2019, 23 COBALD sondes in multi-payload with RS41, ECC, RS92, C50 and C34 (see table )

Table 1: Sounding schedule 2019

Date	Hour	Payload
08.01.2019	start at 23h UTC	RS41+COBALD+ECC
22.01.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
05.02.2019	start at 23h UTC	RS41+COBALD+ECC
19.02.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
05.03.2019	start at 23h UTC	RS41+COBALD+ECC
19.03.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
02.04.2019	start at 23h UTC	RS41+COBALD+ECC
16.04.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
14.05.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
27.05.2019	start at 23h UTC	RS41+COBALD+ECC
11.06.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
25.06.2019	start at 23h UTC	RS41+COBALD+ECC
09.07.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
23.07.2019	start at 23h UTC	RS41+COBALD+ECC
06.08.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
20.08.2019	start at 23h UTC	RS41+COBALD+ECC
03.09.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
17.09.2019	start at 23h UTC	RS41+COBALD+ECC
01.10.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
15.10.2019	start at 23h UTC	RS41+COBALD+ECC
12.11.2019	start at 23h UTC	RS41+COBALD+ECC
26.11.2019	start at 23h UTC	RS41+COBALD+ECC/ RS92/ C50/ C34
10.12.2019	start at 23h UTC	RS41+COBALD+ECC

- In collaboration with the ETH and the DWD at Lindenberg, MeteoSwiss participate in the development and testing of the new PCFH sonde.



# GRUAN Site Report for Payerne (PAY), 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	Payerne
Unique GRUAN ID	PAY
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Main contact	Martucci, Giovanni
WMO no./name	06610 PAYERNE
Operators	currently 16, changes +0 / -0
Sounding Site	2
Lidar	1
GNSS	1

### 1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
PAY-GN-01	GNSS Site PAYE	GNSS	0	not operational
PAY-LI-01	Payerne Raman WV Lidar (RALMO)	Lidar	1	0
PAY-RS-01	Payerne Radiosonde Launch Site	Sounding Site	7	0
PAY-RS-02	Automatic Payerne Launch System (Autosonde)	Sounding Site	1	414

### 1.2 General comments from Lead Centre

#### 1.2.1 General

Good communications between station and GRUAN LC.

## 2 System: GNSS Site PAYE (PAY-GN-01)

<b>Object</b>	<b>Value</b>
System name	GNSS Site PAYE
Unique GRUAN ID	PAY-GN-01
System type	GNSS (GN - GNSS)
Geographical position	46.8121 °N, 6.9439 °E, 548.7 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
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: Payerne Raman WV Lidar (RALMO) (PAY-LI-01)

<b>Object</b>	<b>Value</b>
System name	Payerne Raman WV Lidar (RALMO)
Unique GRUAN ID	PAY-LI-01
System type	Lidar (LI - Lidar)
Geographical position	46.8100 °N, 6.9500 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Martucci, Giovanni
Started at	2013-09-01
Defined setups	1 (TEST-1)
Possible streams	-

#### 3.1 Lead Centre comments

##### 3.1.1 Dataflow

No LIDAR dataflow to GRUAN LC as yet.

## 4 System: Payerne Radiosonde Launch Site (PAY-RS-01)

Object	Value
System name	Payerne Radiosonde Launch Site
Unique GRUAN ID	PAY-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 491.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	-
Defined setups	7 (ROUTINE, OZONE, RESEARCH, SRS-TEST, DUAL, ROUTINE2, ROUTINE3)
Possible streams	COBALD, ECC, RS41, RS92, SRS-C34, SRS-C50

### 4.1 Lead Centre comments

#### 4.1.1 Dataflow

Dataflow to GRUAN LC was running intermittently since September 2011. This dataflow included streams of the Meteolabor SRS-C34, Meteolabor SRS-C50, Vaisala RS92-SGP, Vaisala RS41-SG, and ECC ozone sonde.

Operational data flow of all manual flights is interrupted since January 2018. Restart of this data flow is in active preparation and will be implemented finally soon.

#### 4.1.2 General

Change of operational sonde from MeteoLabor SRS-C50 to Vaisala RS41-SG was in March 2018.

## 5 System: Automatic Payerne Launch System (Autosonde) (PAY-RS-02)

Object	Value
System name	Automatic Payerne Launch System (Autosonde)
Unique GRUAN ID	PAY-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	46.8133 °N, 6.9434 °E, 490.0 m
Operated by	MSWISS   Office fédéral de météorologie et climatologie MeteoSuisse
Instrument contact	Romanens, Gonzague
Started at	2018-03-19
Defined setups	1 (AUTO1)
Possible streams	RS41

### 5.1 Lead Centre comments

#### 5.1.1 Dataflow

Dataflow of auto launcher system to GRUAN LC is running since October 2018. This dataflow includes stream of the operational sonde Vaisala RS41-SG (since March 2018). All launches are promptly recorded using the GuranToolRsLaunch (gtRs!).

#### 5.1.2 General

This auto launcher system was established in March 2018.

### 5.2 GRUAN data products

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

RS41		414	414	
RS41-RAW	001		414	
RS41-EDT	001		414	
RS41-GDP-ALPHA	002		334	

### 5.3 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.

#### 5.3.1 Stream: RS41



### 5.5 Instrument combinations of PAY-RS-02

Count	Instrument combination
414	RS41

### 5.7 Measurement events

