



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

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**8th GRUAN Implementation-  
Coordination Meeting (ICM-8)**

Session 7

Boulder, USA  
25 April – 29 April 2016

## GRUAN Station Report for Sodankylä

*(Submitted by Rigel Kivi)*

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

Report from the GRUAN station Sodankylä for the period March 2015 to March 2016.

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## GRUAN Station Report for Sodankylä (SOD)

Reporting for the period Mar 2015 to Mar 2016

Date: 31-Mar-2016

Primary author: Rigel Kivi

([rigel.kivi@fmi.fi](mailto:rigel.kivi@fmi.fi))

### **Overview**

Sounding measurement programs are contributing to GRUAN data streams. At Sodankylä we have installed receiving systems for both manual and also for the automated soundings. Altogether 52 manual soundings and 970 autosonde launcher soundings have been submitted during the reporting period, using the GRUAN operating procedures. The manual sounding dataflow includes Vaisala RS92-SGP, ECC ozone sonde, CFH water vapor, Internet IMET-1, Vaisala RS80, RS41. The data have been transmitted using the RsLaunchClient software. Preparations have been made to start the GNSS dataflow. One of the improvements is that near real time data flow has been established regarding RS92. The site was visited by the GRUAN Lead Center (Dr. Michael Sommer) in October 2015.

### **Change and change management**

No major changes have taken place during the reporting period. RS92 and RS41 comparison flights have been made at Sodankylä. RS41 showed improvements for humidity and temperature measurements compared to the RS92. In addition we were able to test the new interface for the RS41/ozone sonde flights. Also tests with the CFH reference were made. It is planned to start using RS41 for CFH soundings.

### **Resourcing**

Budget funding does not cover all the research activities, therefore external funding is needed to continue with these activities.

### **Site assessment and certification**

The Sodankylä site was certified during the reporting period. The certification was officially presented to the Director of the FMI during the WMO conference in Geneva in summer 2015.

### **GRUAN related research**

GRUAN research is related to the GATNDOR and the Radiosonde task team.

### **WG-GRUAN interface**

Letter of support would be useful from the Working Group on GRUAN. Probably also other ways might be possible to increase GRUAN visibility within the institute. For example we thank the GRUAN Lead Centre for providing the new GRUAN Brochures. The Brochures are very helpful to present the activities within GRUAN.

### **Items for ICM-8 plenary discussions**

Change management issues, for example in case of RS92/RS41. Also external funding possibilities would be of interest to discuss with the GRUAN partners. Finally, we are interested to include the GNSS dataflow.

**Future plans**

Over the coming year we expect to improve some of the instrumentation at the site and participate in the GRUAN task team activities. One of the new developments within GRUAN would be the planned start of RS41 as an interface for the CFH.



# GRUAN Station Report for Sodankyla (SOD), 2015

Reported time range is Nov 2014 to Feb 2016

Created by the Lead Centre

Version from 2016-04-18

## 1 General GRUAN station information

Info	Value
Station name	Sodankyla
Unique GRUAN ID	SOD
Geographical position	67.3700 °N, 26.6300 °E, 179.0 m
Operated by	FMI   Ilmatieteen laitos
Main contact	Kivi, Rigel
WMO no./name	02836 SODANKYLÄ
Operators	current 8, change +0 / -0
Sounding Site	2
GNSS	1

### 1.1 General information about GRUAN measurement systems

System	Type	Setups	Measurements	As scheduled
SOD-GN-01	GNSS	0	0	not scheduled
SOD-RS-01	Sounding Site	3	52	60.47 %
SOD-RS-02	Sounding Site	1	970	99.79 %

### 1.2 General comments from Lead Centre

#### 1.2.1 General

Two sounding sites have been defined, one for manual launches, one for the auto-launcher, even though both sites are in close proximity.

## 2 System: GNSS Site SODA (SOD-GN-01)

<b>Info</b>	<b>Value</b>
System name	GNSS Site SODA
Unique GRUAN ID	SOD-GN-01
System type	GNSS (GN - GNSS)
Geographical position	67.4209 °N, 26.3890 °E, 299.7 m
Operated by	FMI   Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	-
Defined setups	-
Possible streams	-

### 2.1 Lead Centre comments

#### 2.1.1 Dataflow

Dataflow of GNSS data to GRUAN LC and the GRUAN GNSS processing centre at GFZ has started in February 2015. The current dataflow includes manufacturer raw data, converted raw data (RINEX) and instrument logs, containing all equipment changes.

### 3 System: Radiosonde Launch Site (SOD-RS-01)

Info	Value
System name	Radiosonde Launch Site
Unique GRUAN ID	SOD-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	67.3700 °N, 26.6300 °E, 179.0 m
Operated by	FMI   Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	-
Defined setups	3 (OZONE, RESEARCH, ROUTINE2)
Possible streams	CFH, COBALD, RS41, RS80, RS92

#### 3.1 Lead Centre comments

##### 3.1.1 Dataflow

Dataflow to GRUAN LC is operational since October 2010, with some gaps until April 2012. Dataflow includes: Vaisala RS92-SGP, ECC ozone sonde, CFH water vapour, Internet IMET-1, and Vaisala RS80. The launches are promptly transmitted using RsLaunchClient.

##### 3.1.2 General

This is the manual launch site, used for ECC ozone sondes, CFH sondes and other manually released research sondes.

#### 3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCDC
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##### 3.2.1 Stream: CFH

CFH		2	2	
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##### 3.2.2 Stream: ECC

ECC		52	52	
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##### 3.2.3 Stream: IMET-1

IMET-1		2	2	
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##### 3.2.4 Stream: RS41

RS41		2	2	
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##### 3.2.5 Stream: RS92

RS92		52	52	
RS92-RAW	001		52	
RS92-GDP	002		43	30

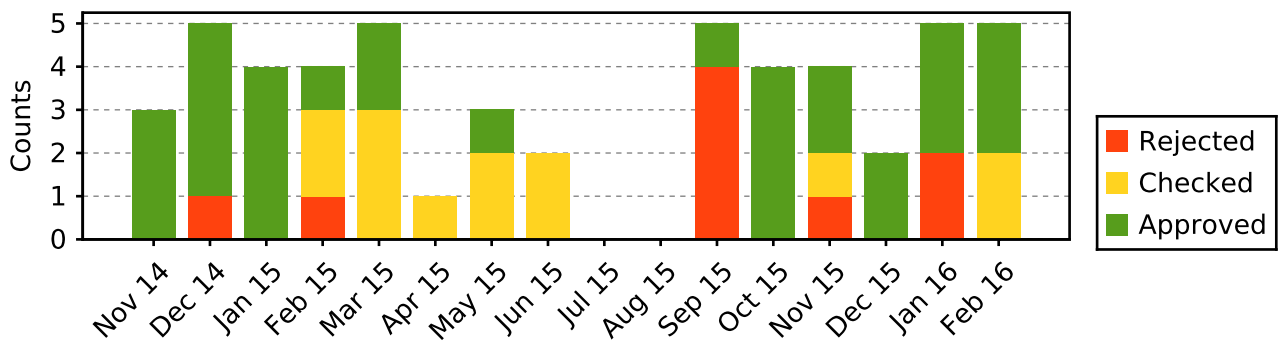
#### 3.3 Data quality of current GRUAN data products

Month	Count	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

3.3.1 Stream: RS92 (Product: RS92-GDP-002)

Nov 14	3	3							1
Dec 14	5	4		1			1		
Jan 15	4	4							1
Feb 15	4	1	2	1			3		2
Mar 15	5	2	3					3	
Apr 15	1		1					1	
May 15	3	1	2					2	1
Jun 15	2		2					2	
Jul 15									
Aug 15									
Sep 15	5	1		4					
Oct 15	4	4							2
Nov 15	4	2	1	1			1		
Dec 15	2	2							1
Jan 16	5	3		2					2
Feb 16	5	3	2					2	4
	<b>52</b>	<b>30</b>	<b>13</b>	<b>9</b>			<b>5</b>	<b>10</b>	<b>14</b>

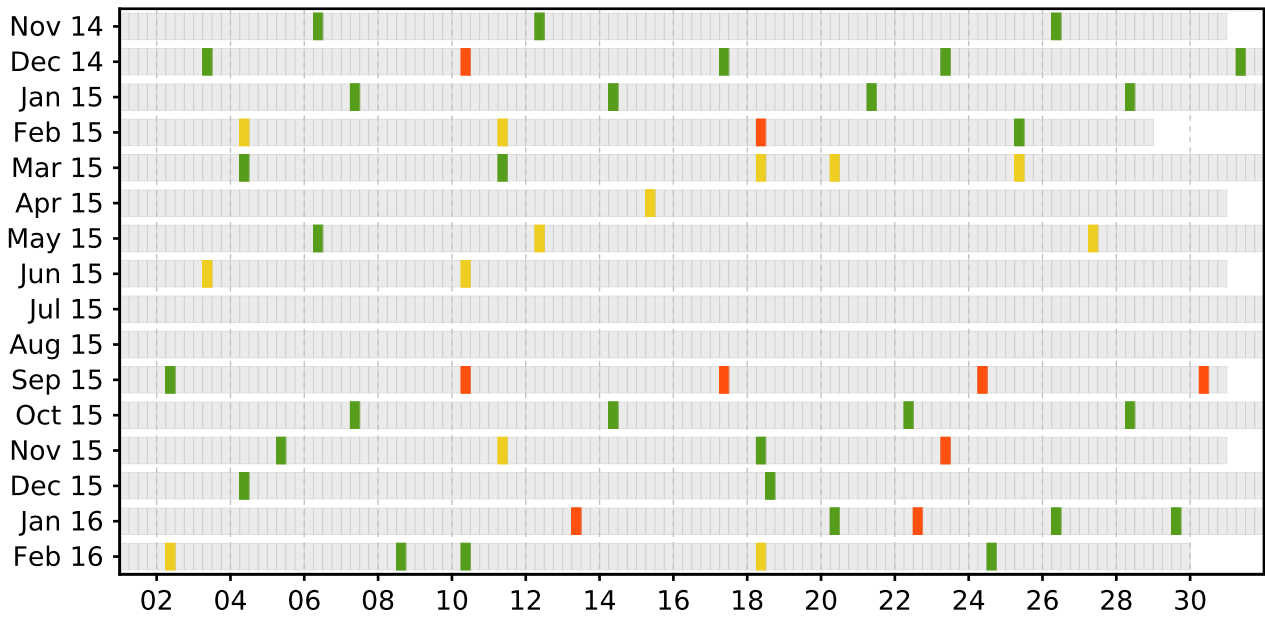
Data quality statistic of stream RS92





Month	Count	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

Schedule data quality of stream RS92



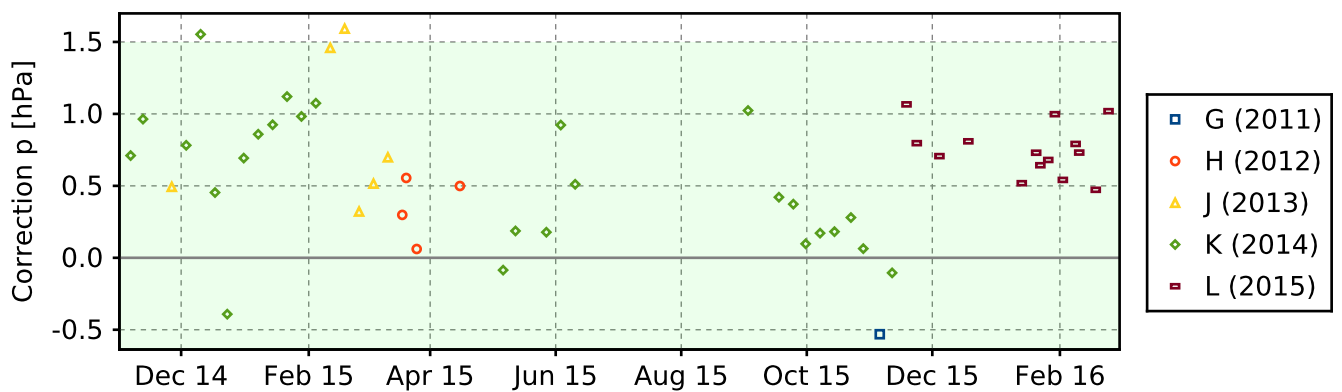
### 3.4 Instrument combinations of SOD-RS-01

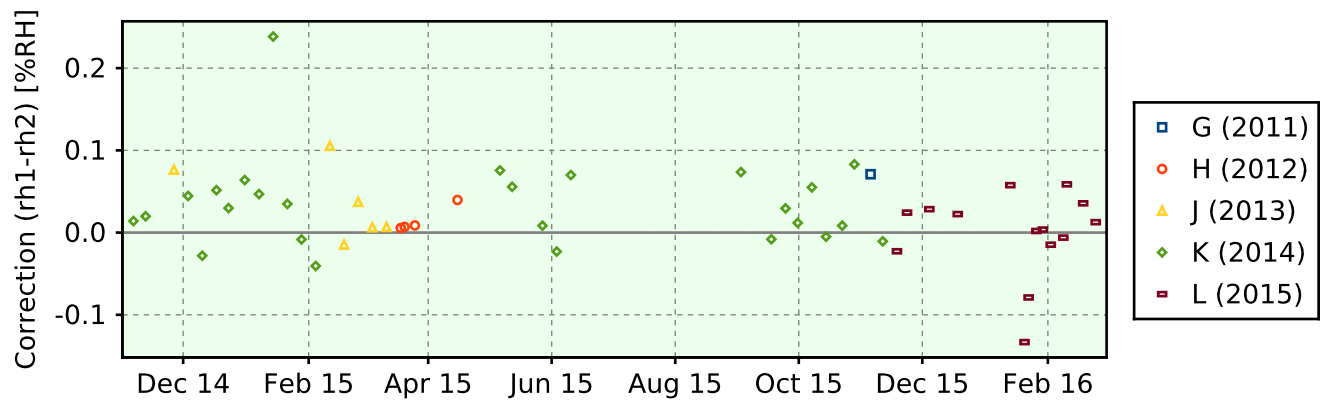
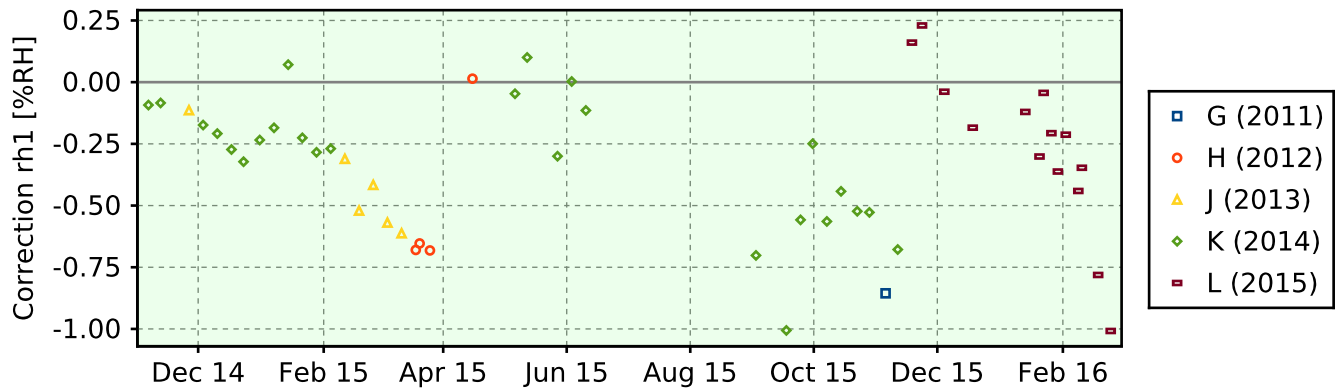
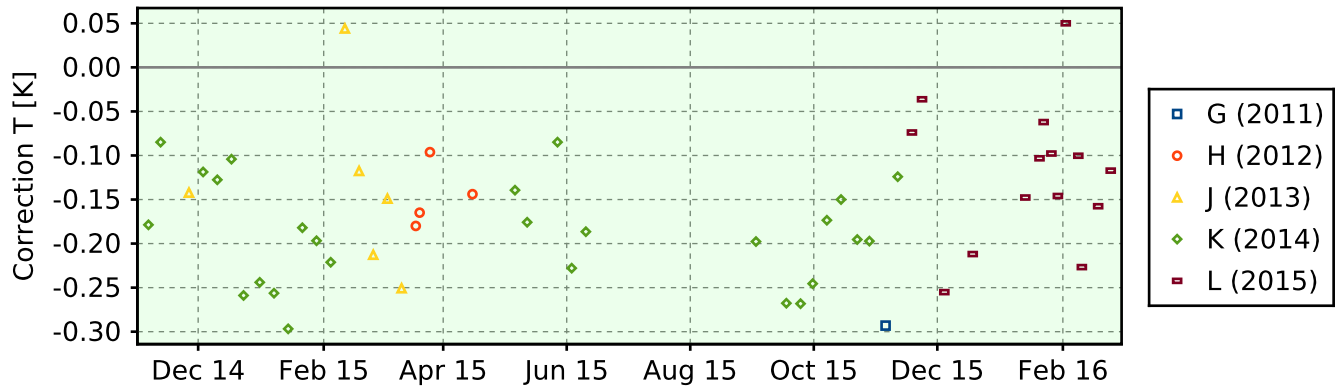
Count	Instrument combination
2	CFH, ECC, IMET-1, RS41, RS92
50	ECC, RS92

### 3.5 Instrument ground check

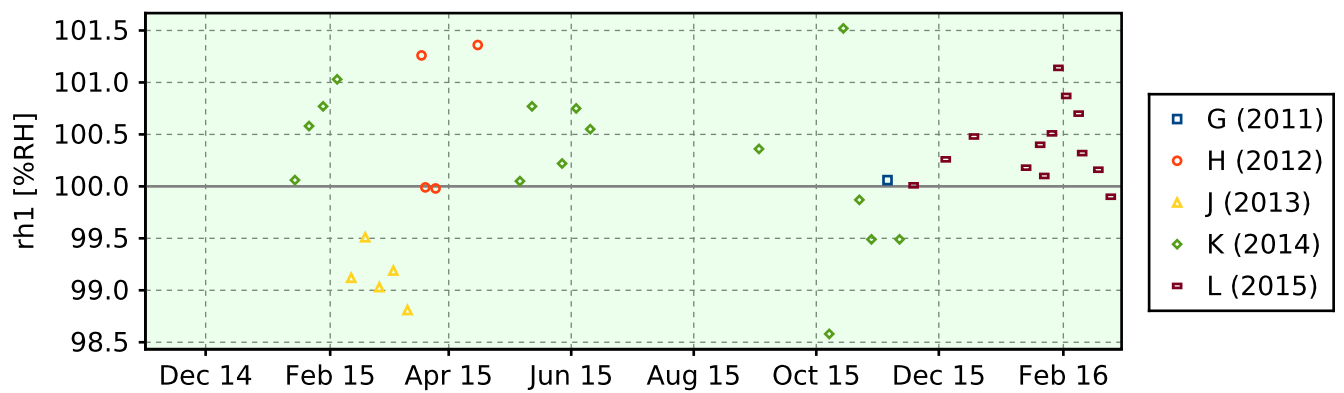
#### 3.5.1 Stream: RS92

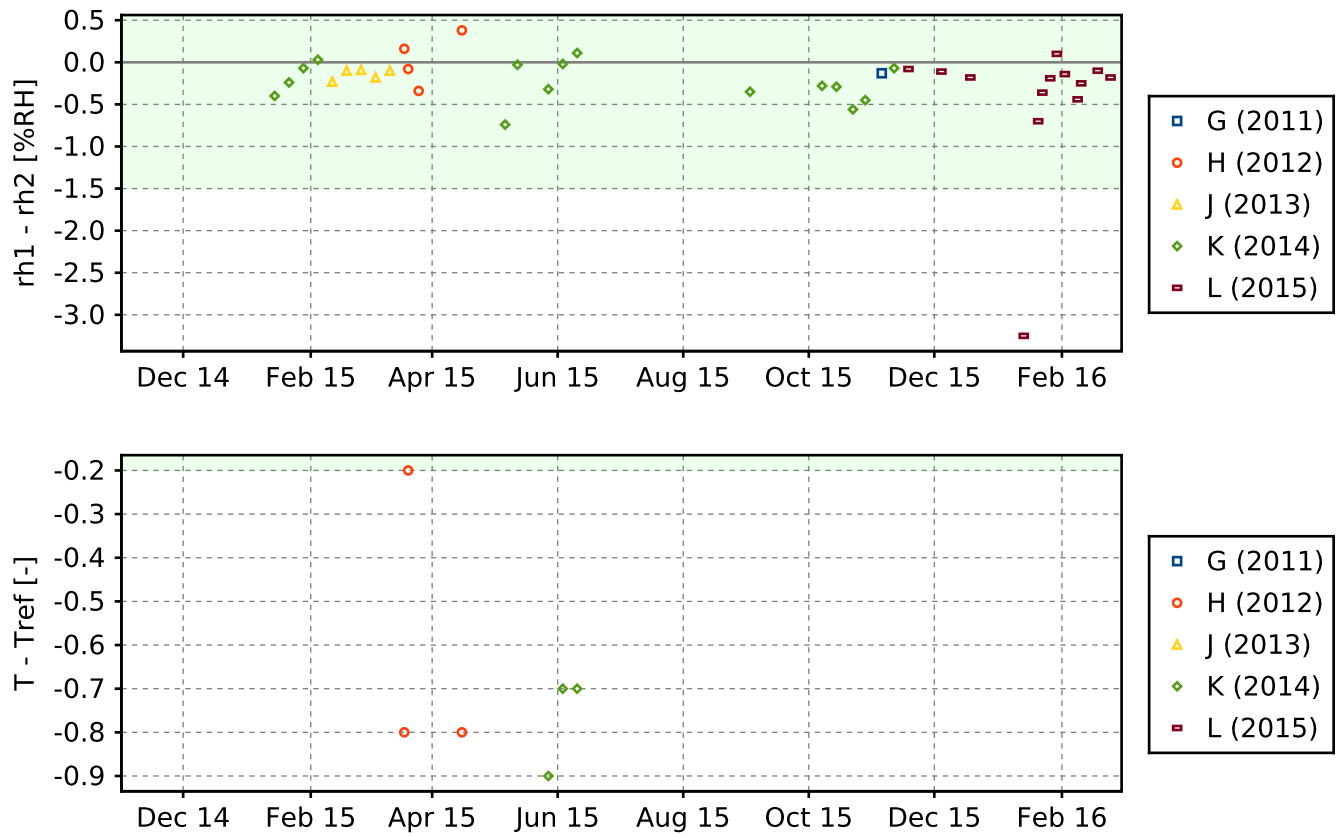
##### 3.5.1.1 GroundCheck: GC25





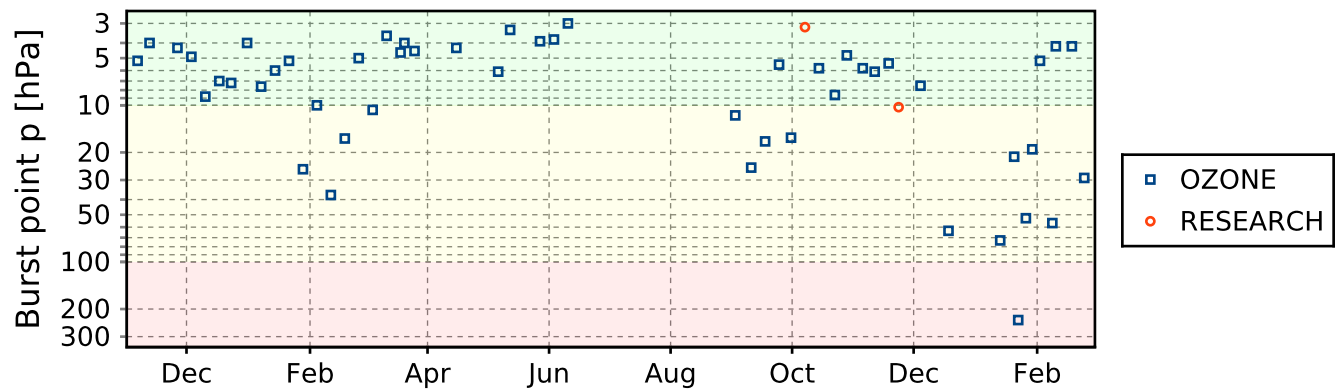
**3.5.1.2 GroundCheck: SHC**





### 3.6 Measurement events

#### 3.6.1 Stream: RS92



## 4 System: Automatic Radiosonde Launch System (AUTOSONDE)

Info	Value
System name	Automatic Radiosonde Launch System (AUTOSONDE)
Unique GRUAN ID	SOD-RS-02
System type	Sounding Site (RS - Radiosonde)
Geographical position	67.3700 °N, 26.6300 °E, 179.0 m
Operated by	FMI   Ilmatieteen laitos
Instrument contact	Kivi, Rigel
Started at	2008-01-01
Defined setups	1 (ROUTINE)
Possible streams	RS92

### 4.1 Lead Centre comments

#### 4.1.1 Dataflow

Dataflow to GRUAN LC is operational since January 2011. Currently a weekly delivery to GRUAN LC is implemented.

#### 4.1.2 Data quality

Only few data processing issues (corrupt files or unknown issues).

One third of all measurements passed GRUAN Quality Control routines with a 'checked' label, largely due to uncertainty inconsistencies in pressure and humidity.

GC25 ground check corrections are within expected limits.

The use of a manufacturer independent ground check (e.g. SHC) is highly recommended.

#### 4.1.3 General

This is the auto-launcher data stream.

### 4.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCDC
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#### 4.2.1 Stream: RS92

RS92		970	970	
RS92-RAW	001		970	
RS92-GDP	002		885	519

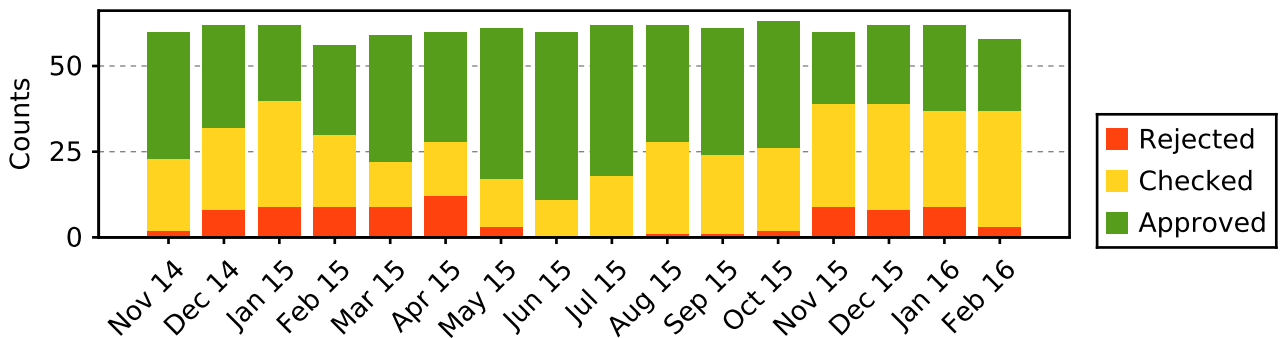
### 4.3 Data quality of current GRUAN data products

Month	Count	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

#### 4.3.1 Stream: RS92 (Product: RS92-GDP-002)

Month	Count	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH
Nov 14	60	37	21	2			5		20
Dec 14	62	30	24	8			9		24
Jan 15	62	22	31	9			9		30
Feb 15	56	26	21	9			11		19
Mar 15	59	37	13	9			8	3	11
Apr 15	60	32	16	12			13		15
May 15	61	44	14	3			5		12
Jun 15	60	49	11				3		9
Jul 15	62	44	18				1		17
Aug 15	62	34	27	1			3		25
Sep 15	61	37	23	1			4		20
Oct 15	63	37	24	2			2		24
Nov 15	60	21	30	9			9		30
Dec 15	62	23	31	8			13		29
Jan 16	62	25	28	9			12		28
Feb 16	58	21	34	3			4	5	33
	<b>970</b>	<b>519</b>	<b>366</b>	<b>85</b>			<b>111</b>	<b>8</b>	<b>346</b>

Data quality statistic of stream RS92



Month	Count	GRUAN Data Quality			Issues				
		Approved	Checked	Rejected	Meta-data	Process.	Press	Temp	RH

Schedule data quality of stream RS92



#### 4.4 Instrument combinations of SOD-RS-02

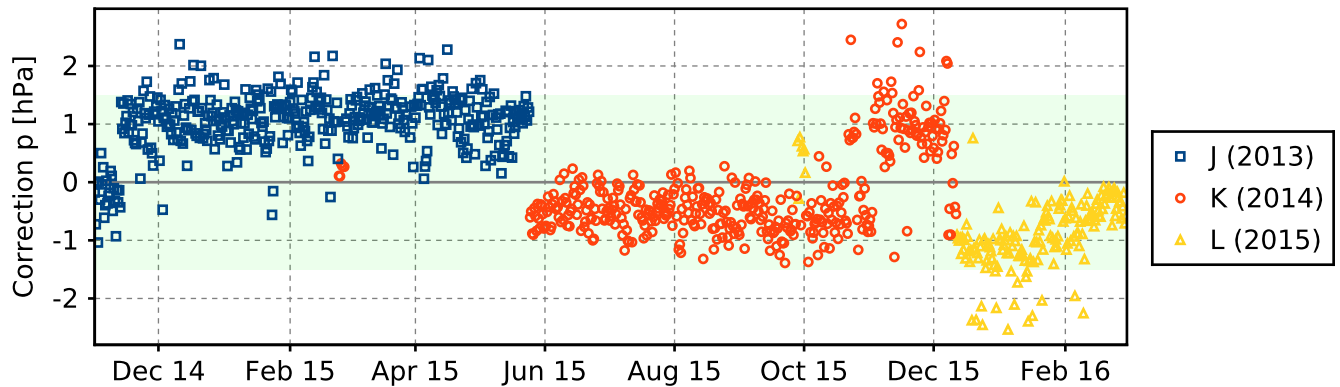
Count Instrument combination

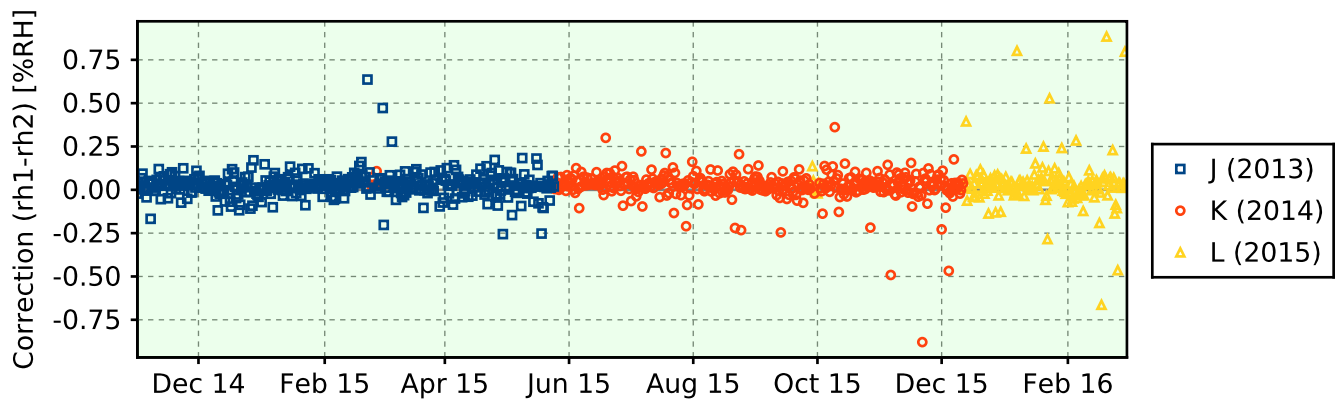
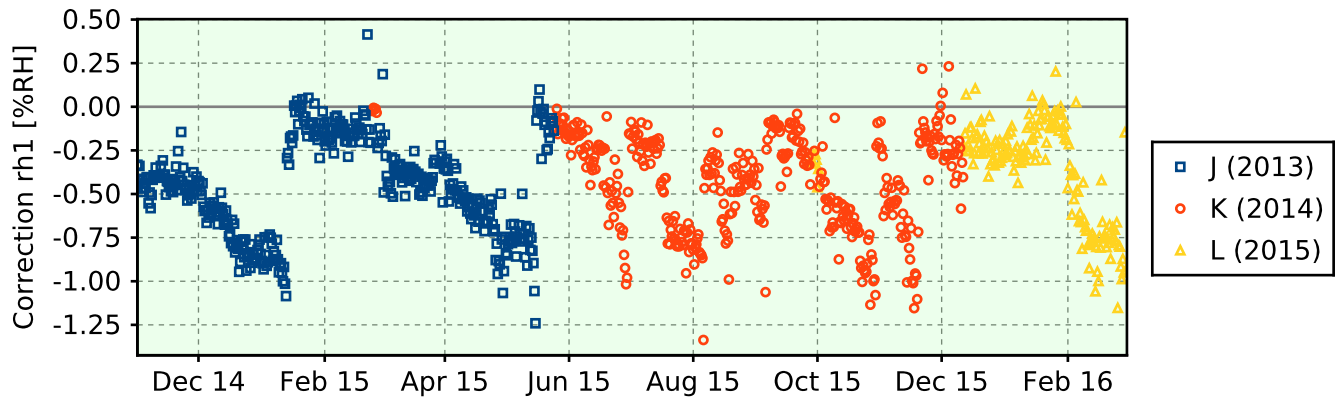
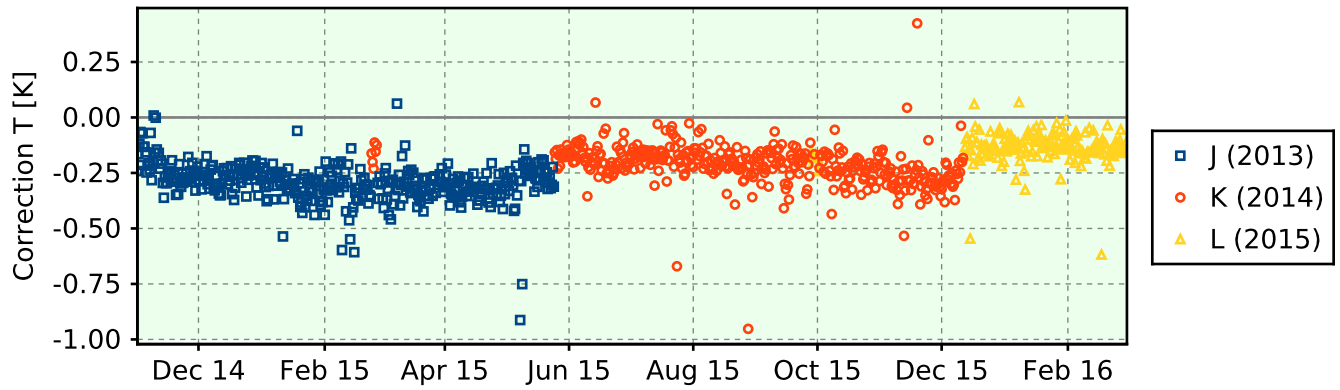
970 RS92

#### 4.5 Instrument ground check

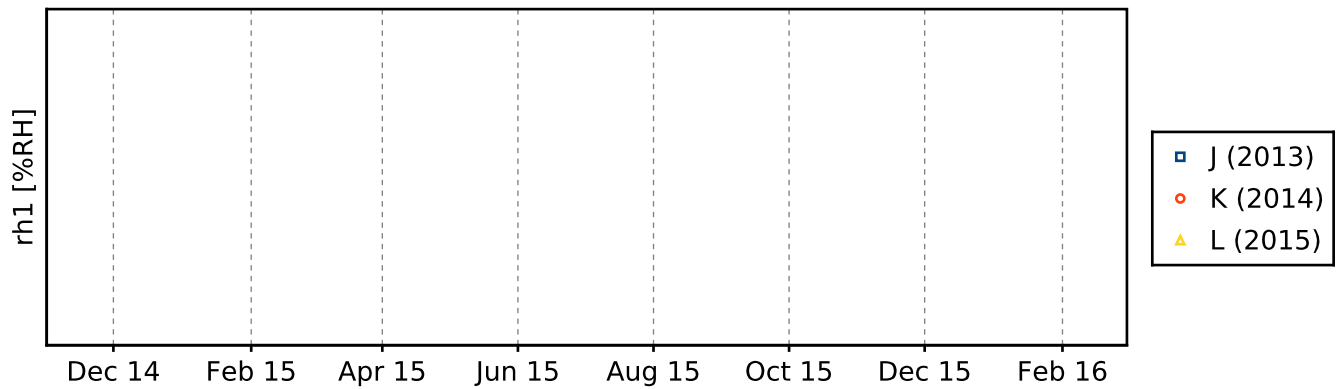
##### 4.5.1 Stream: RS92

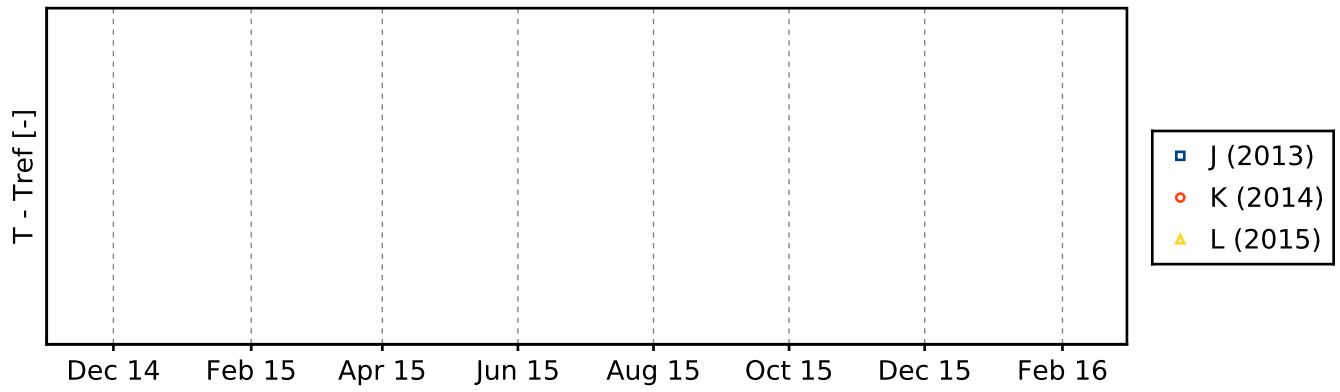
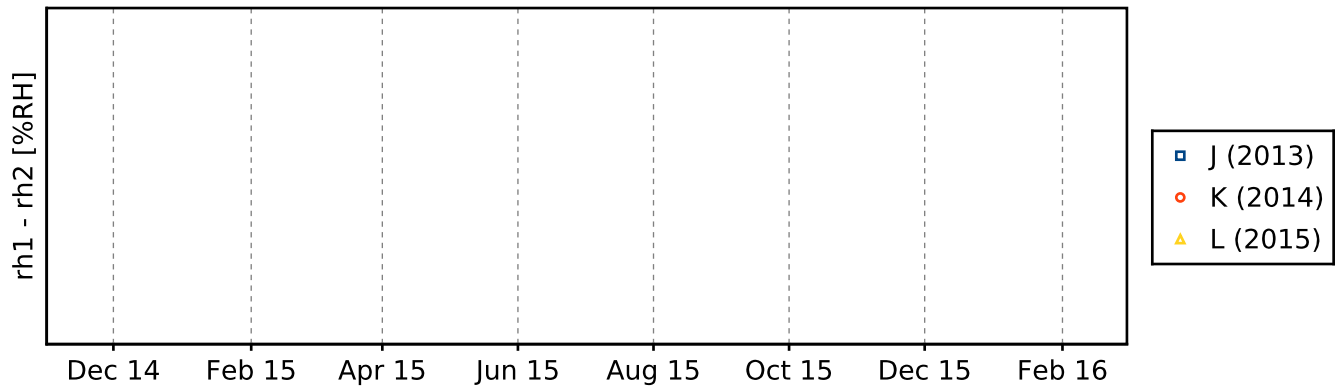
##### 4.5.1.1 GroundCheck: GC25





4.5.1.2 GroundCheck: SHC





## 4.6 Measurement events

### 4.6.1 Stream: RS92

