



HKD monitoring and ReOBS

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CCRES/CLU Training school, Munich, 2-5 Sept. 2025

Introduction

1. HKD monitoring

- a. Introduction
- b. How to access and use the grafana
- c. Explore your data

2. Data quality

- a. Introduction
- b. Explore REOBS files

3. Questions and feedbacks

HKD Monitoring with grafana

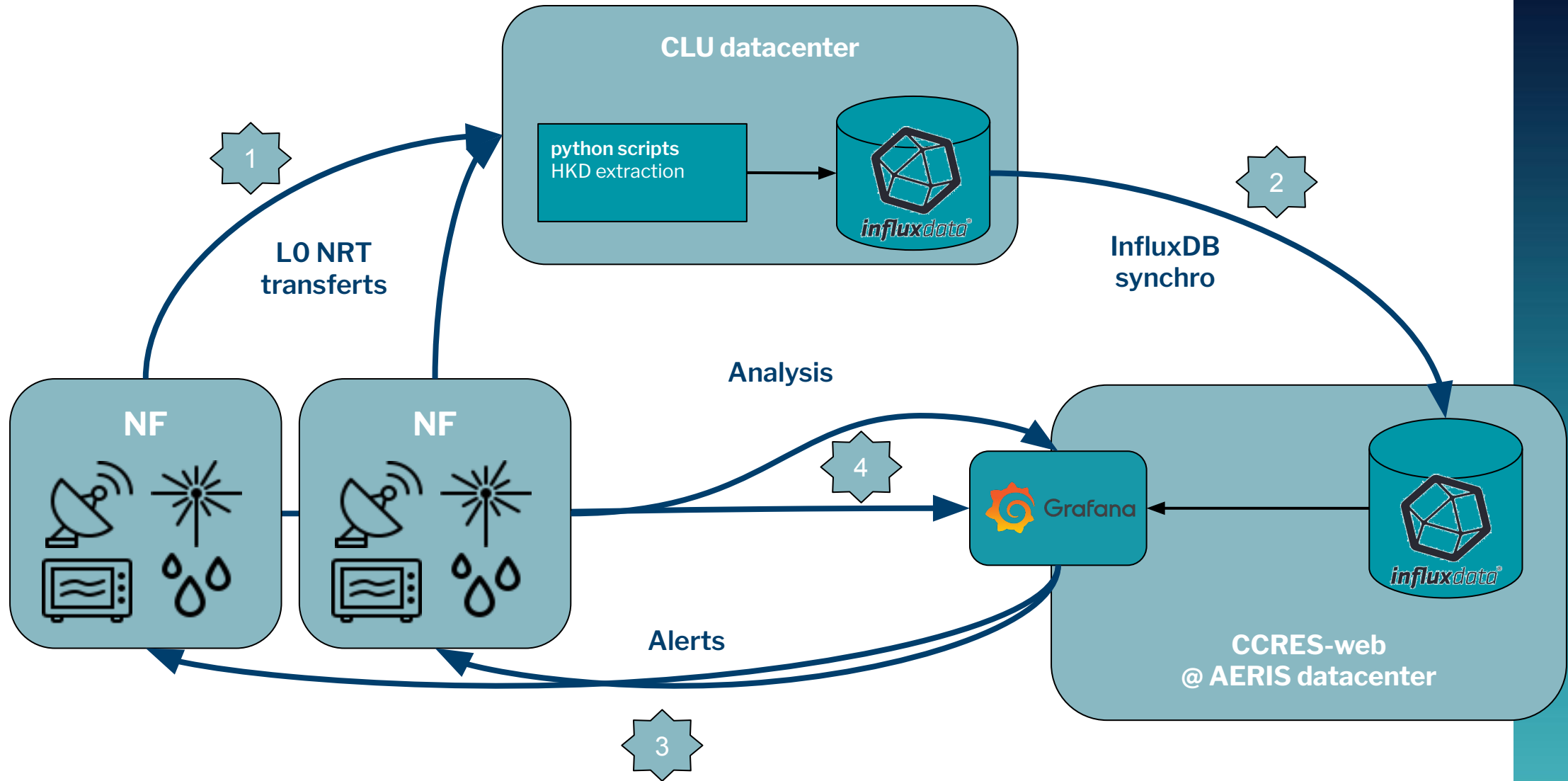
M-A Drouin (IPSL)

HouseKeeping Data : what and why ?

- Instrumental parameters
 - Provided in data files or in ancillary files
- Examples :
 - ALC : Laser energy, window transmission, status flags ...
 - DCR : Internal temperature, intensity, voltage ...
 - MWR: Ambient target stability, alarm/quality flags ...
 - DWL : internal temperature ...
 - DD : Instrument status ...
- Goals
 - Allowing more **efficient instrument failures detection**
 - Curative maintenance
 - Ensure **optimal performances** of sensors
 - Ensure **long term high quality** geophysical data

Analysis of HKD data will be done for NF **labelling**

HouseKeeping Data : architecture



Grafana (1/2)

- Grafana (<https://grafana.com/grafana>)
 - Web application for timeseries data
 - Querying
 - Visualisation
 - Alerting
 - Open Source and free
 - First release in 2014, now in version 12
 - Compatible with lot of data sources
 - Among them influxDB
- Visualisations
 - Creation of interactives dashboards
 - “Understand” units
 - Lots of plugins (+300)
 - Data sources and visualization



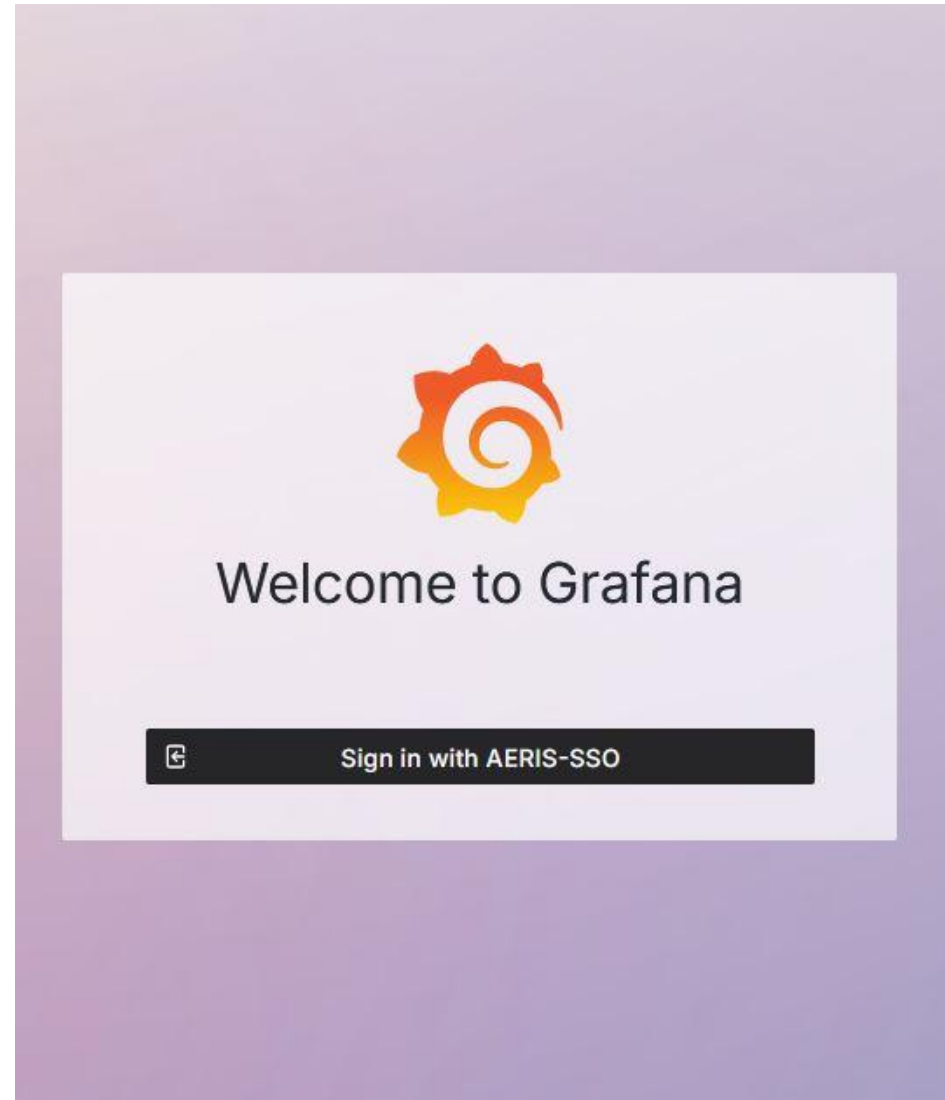
Grafana (2/2)

- Alerts management
 - Alert rules
 - What variable(s) to check
 - What period to check
 - How often to check
 - Preprocess data: min, max, mean, count, sum
 - Define severity of problem
 - Notifications
 - Different contact points can be defined per alert
 - Several channels : emails, slack ...
 - Can depend on severity level
 - Quicklooks are sent with notifications

Access to grafana

Access to grafana (1/3)

- All informations available on <https://ccres.ipsl.fr/docs/>
- Go to <https://ccres.ipsl.fr/grafana/>
 - **don't forget the ending "/"**
- click on "Sign in with AERIS-SSO"



Access to grafana (2/3)

- 3 methods to log in (by recommendation order)

1. **ORCID**
2. **edugain (academic credentials)**
3. **ENVRI**
 - a. **ORCID**
 - b. **github**
 - c. **google**
4. **Account on AERIS**

- Always use the same method
 - if not it could create multiple accounts
 - grafana identify you by your email
- After your first login
 - send an email to ccres-dev@listes.ipsl.fr
 - to get access to NF organization

Log In

This page is a global logon system for Aeris and DataTerra partners. Please login or register with your SSO Account, Renater or Orcid.


Email


Password


☐ Remember me

[Forgot Password?](#)


Log In







New user? [Register](#)



Service provided by Aeris

Access to grafana (3/3)

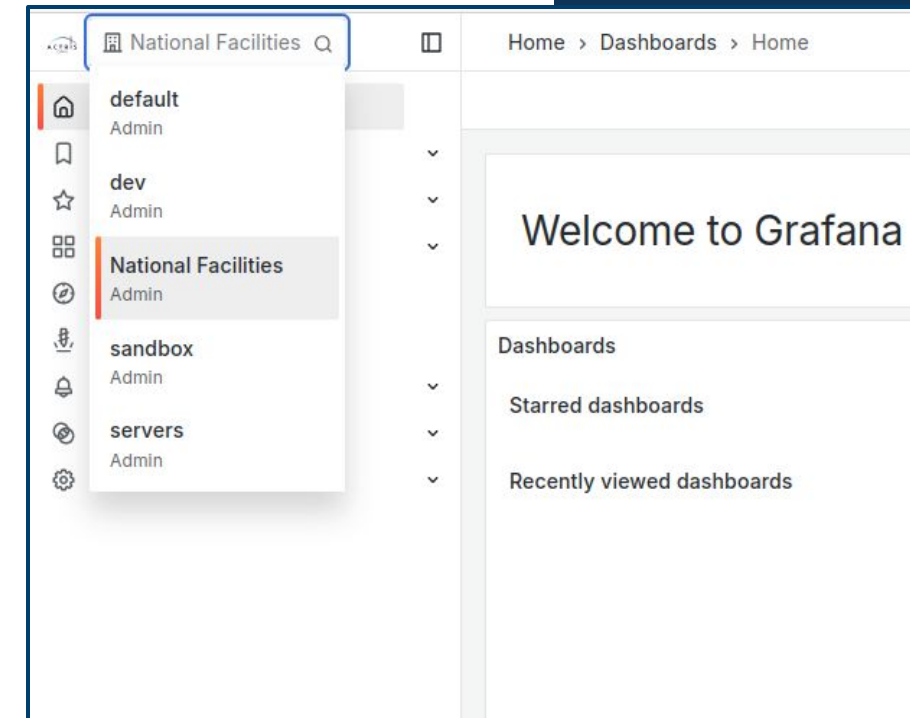
Some problems you may encounter

- AERIS may request email validation and you didn't receive the email
 - Check your SPAM box
 - The email can be blocked by IT security
 - Contact ccres-dev@listes.ipsl.fr and we will manually validate your account
 - Can require some time
- Error message : “**Forbidden. You don't have permission to access /grafana/ on this server.**” before accessing homepage
 - Try to remove the cookies from ipsl.fr
 - Use your browser in private mode

Using grafana

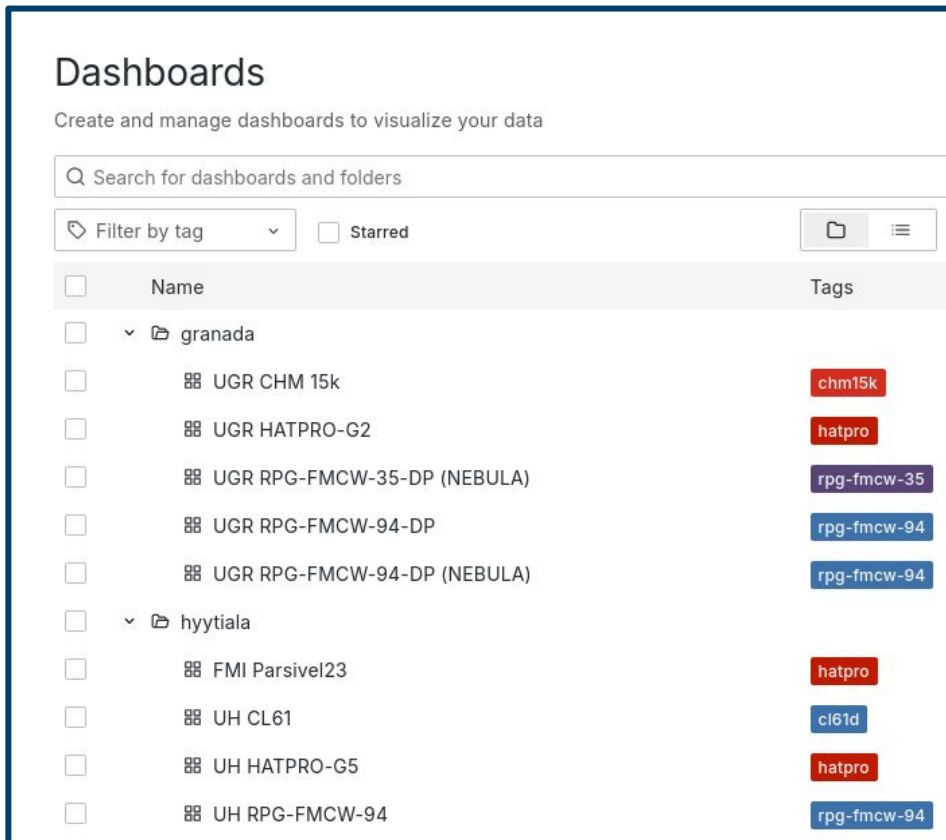
“National facilities” organization

- Organization in grafana
 - Mostly an entity grouping users, data sources and dashboards
 - Data sources and dashboards can't be shared between organizations
 - Several can exists
 - An user can belong to several
- In national facilities organization
 - User only have **viewer** access
 - **Can't** modify anything
- A **Dev** organization is available for CCRES unit members
 - Use to develop dashboards
 - Use to do tests
- Participants to this training have access to **sandbox** organization
 - User have **editor** right
 - Can **create** and **modify** dashboards



Main menu : dashboards (1/3)

- **Dashboards** menu
 - access to available dashboards sorted by NF
- A directory per NF containing available dashboards

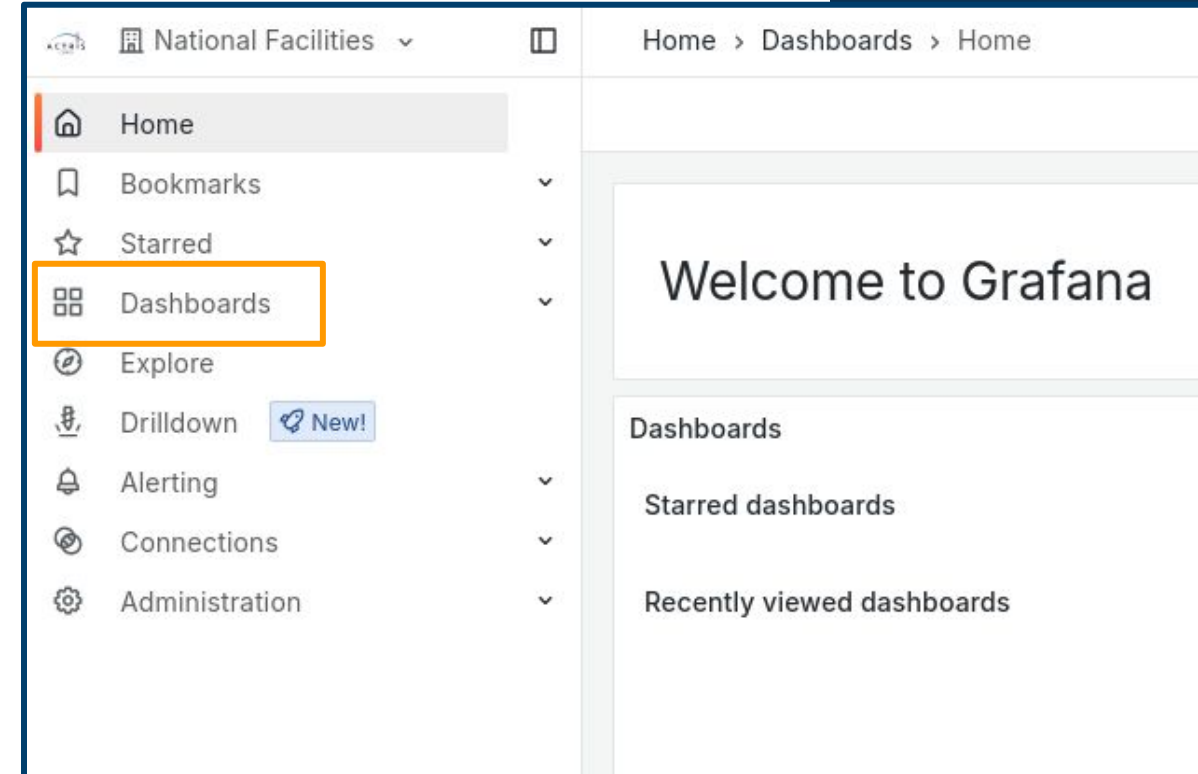


Dashboards
Create and manage dashboards to visualize your data

Search for dashboards and folders

Filter by tag ☐ Starred

<input type="checkbox"/>	Name	Tags
<input type="checkbox"/>	▼ granada	
<input type="checkbox"/>	UGR CHM 15k	chm15k
<input type="checkbox"/>	UGR HATPRO-G2	hatpro
<input type="checkbox"/>	UGR RPG-FMCW-35-DP (NEBULA)	rpg-fmcw-35
<input type="checkbox"/>	UGR RPG-FMCW-94-DP	rpg-fmcw-94
<input type="checkbox"/>	UGR RPG-FMCW-94-DP (NEBULA)	rpg-fmcw-94
<input type="checkbox"/>	▼ hyytiala	
<input type="checkbox"/>	FMI Parsivel23	hatpro
<input type="checkbox"/>	UH CL61	cl61d
<input type="checkbox"/>	UH HATPRO-G5	hatpro
<input type="checkbox"/>	UH RPG-FMCW-94	rpg-fmcw-94



National Facilities

Home > Dashboards > Home

- Home
- Bookmarks
- Starred
- Dashboards**
- Explore
- Drilldown [New!](#)
- Alerting
- Connections
- Administration

Welcome to Grafana

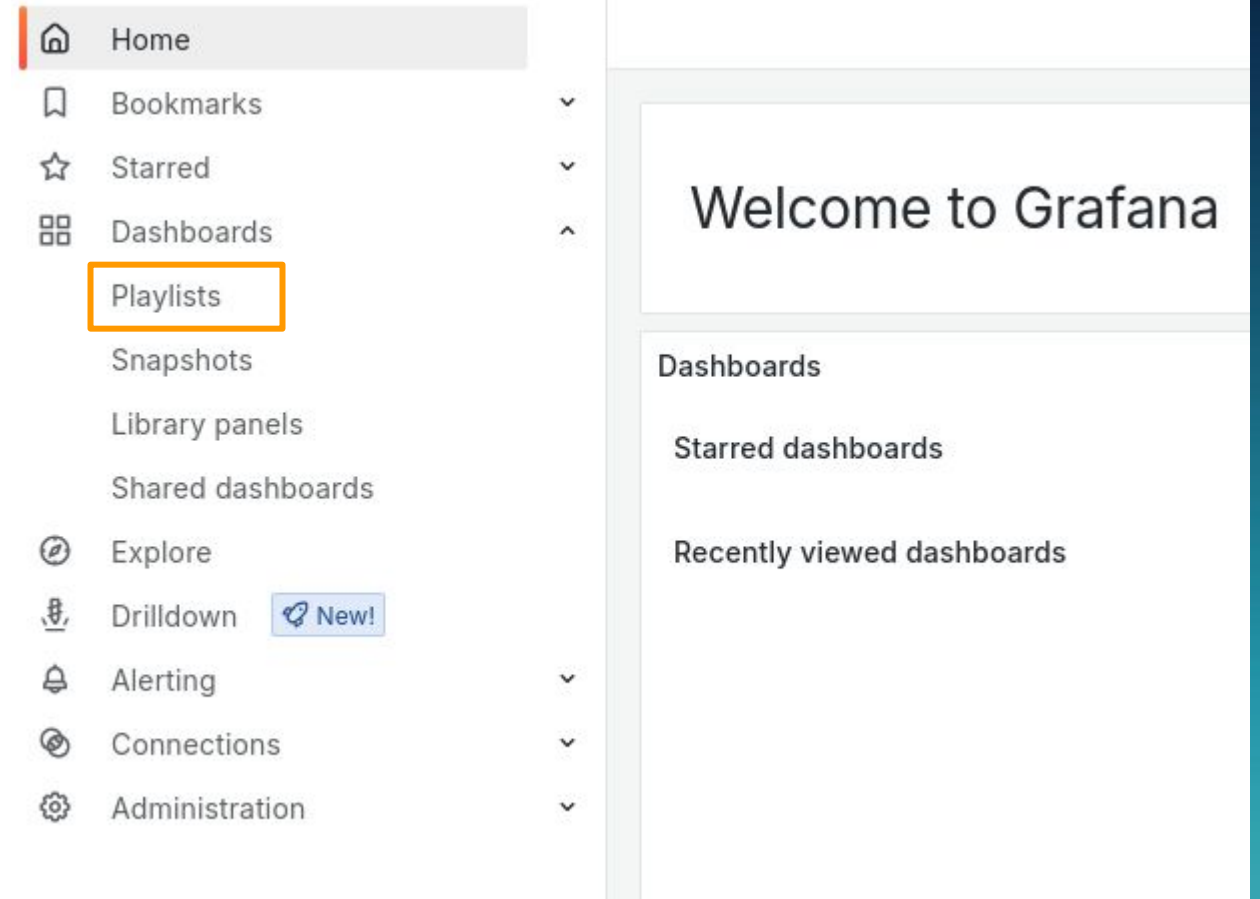
Dashboards

- Starred dashboards
- Recently viewed dashboards

Main menu : dashboards (2/3)

- **Playlists Menu**

- Allows to iterate between dashboards
- Change of dashboard every 30s
- Coming soon
 - one playlist per NF
 - one playlist per instrument type
- Example available
 - bucharest
 - palaiseau
 - CL61



Main menu : dashboards (3/3)

- Dashboards for 10 models of instruments available at the moment
 - RADARs
 - basta
 - RPG FMCW 35 and 94 GHz
 - MWRs
 - RPG hatpro
 - ALCs
 - lufft chm15k
 - vaisala ct25k, cl31, cl51 and cl61
 - campbell scientific cs135
- At least one dashboard for 35 stations
- Based on templates
 - Automatically deployed based on metadata available in cloudnet
 - Script is run once a week to check for update on NFs status
 - New NF that started to send data
 - Data from new instrument is added
 - If you have several instrument of the same model sent to cloudnet
 - One dashboard per instrument
 - Identified by its PID
 - <https://github.com/ACTRIS-CCRES/HKD>

Using dashboards (1/3)

- In “national facilities” organization
 - You cannot modify the dashboards
- You can choose the period of data you want to visualize
 - Default last 24h
 - All the data you sent to cloudnet should be available

Absolute time range

From
now-24h

To
now

Apply time range

It looks like you haven't used this time picker before. As soon as you enter some time intervals, recently used intervals will appear here.

[Read the documentation](#) to find out more about how to enter custom time ranges.

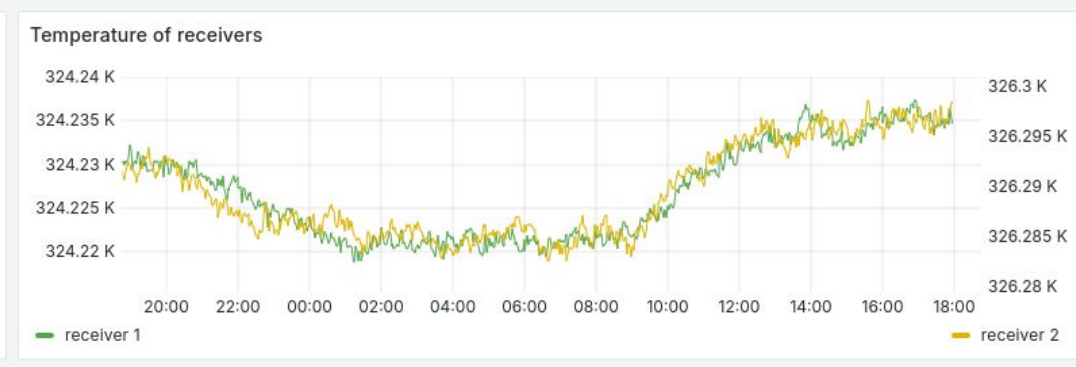
Search quick ranges

- Last 5 minutes
- Last 15 minutes
- Last 30 minutes
- Last 1 hour
- Last 3 hours
- Last 6 hours
- Last 12 hours
- Last 24 hours**
- Last 2 days

Browser Time France, CEST UTC+02:00 Change time settings

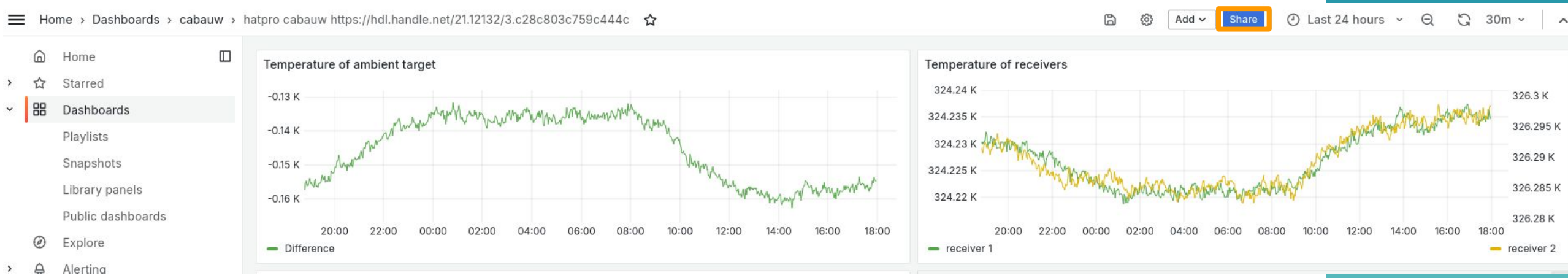
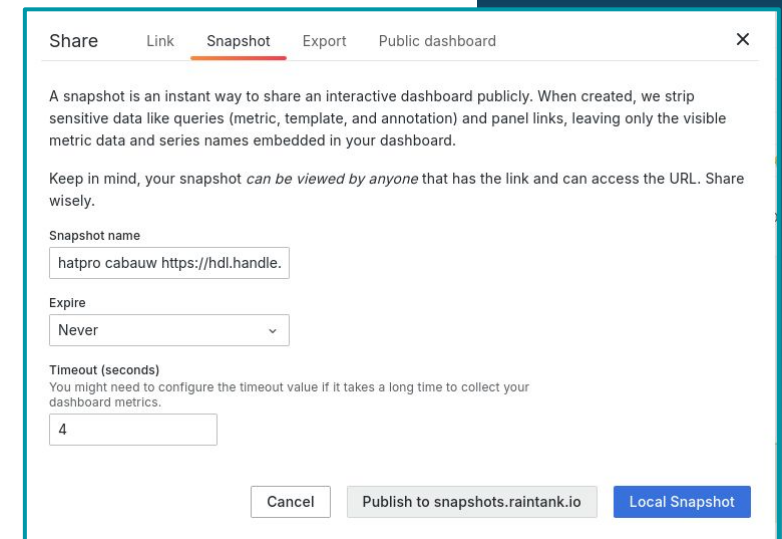
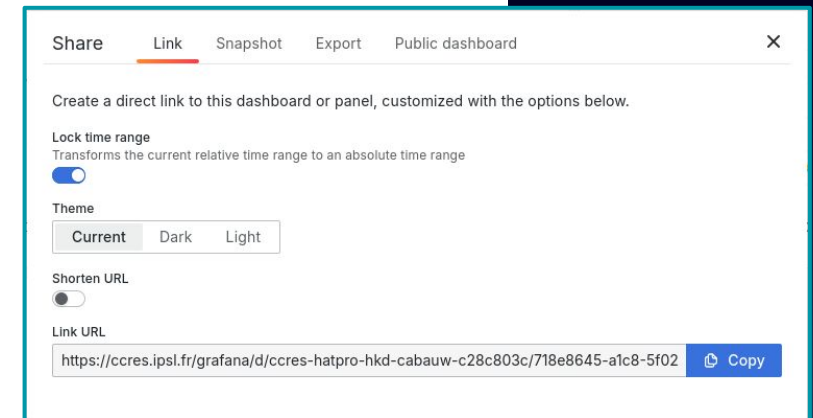
Home > Dashboards > cabauw > hatpro cabauw <https://hdl.handle.net/21.12132/3.c28c803c759c444c>

- Home
- Starred
- Dashboards**
- Playlists
- Snapshots
- Library panels
- Public dashboards
- Explore
- Alertina



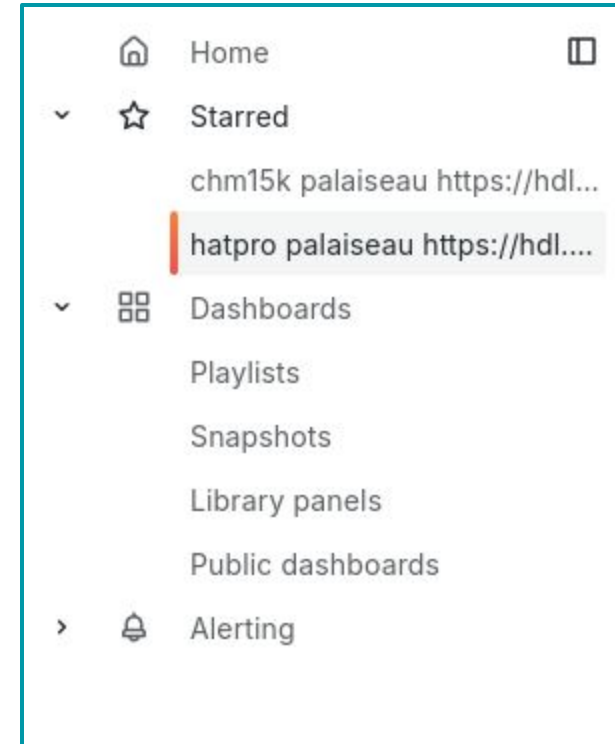
Using dashboards (2/3)

- **Share** menu
- **Link** submenu
 - Get direct link to dashboards
- **Snapshot** submenu
 - Take snapshots of the dashboards
- **Export** submenu
 - Get the json schema of the dashboard
- You are not allow to create public link to dashboards



Using dashboards (3/3)

- **Favorite** menu
- Let you mark dashboards as favorite
- They will be a shortcut on your homepage



Home > Dashboards > cabauw > hatpro cabauw https://hdl.handle.net/21.12132/3.c28c803c759c444c



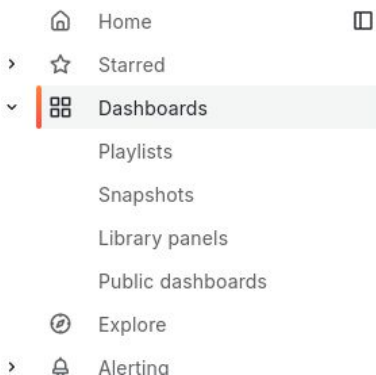
Add v

Share

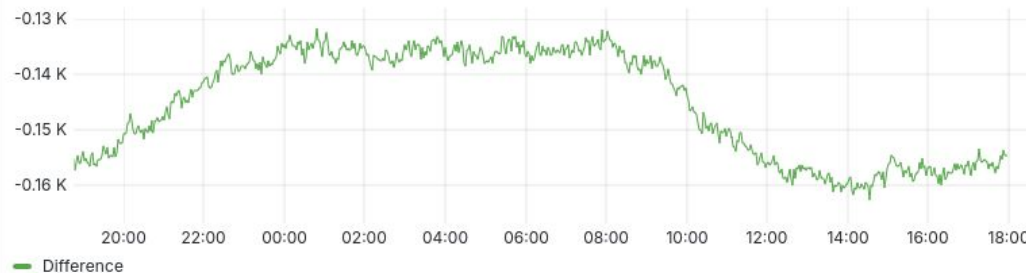
Last 24 hours v



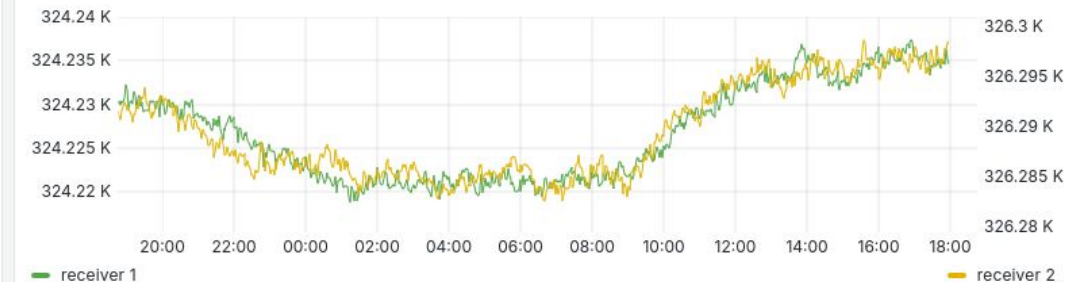
30m v



Temperature of ambient target



Temperature of receivers



Demo

Next updates

- Next instruments
 - Halo (should already be available, data are available)
 - Priority to MIRA HKDs
 - Strategy is defined
 - Need to collect data and process them
- Continue work on automatic alerting

▼ 📁 palaiseau > palaiseau_1h

3 normal | 1h | ⓘ ✎

State	Name	Health	Summary	Next evaluation	Actions
> Normal	hatpro_palaiseau_ambient-target-sensor-1-temperature	ok	warning : hatpro palaiseau	in an hour	👁 View ✎ Edit ⋮ More ▼
> Normal	palaiseau_chm15k_module-temperature	ok		in an hour	👁 View ✎ Edit ⋮ More ▼
> Normal	plaiseau_chm15k_ntp-note	ok		in an hour	👁 View ✎ Edit ⋮ More ▼

Build your own dashboard

Build your own dashboards (2/7)

- Create a directory to put your dashboards

Dashboards

Create and manage dashboards to visualize your data

▾

☐ Starred

Sort

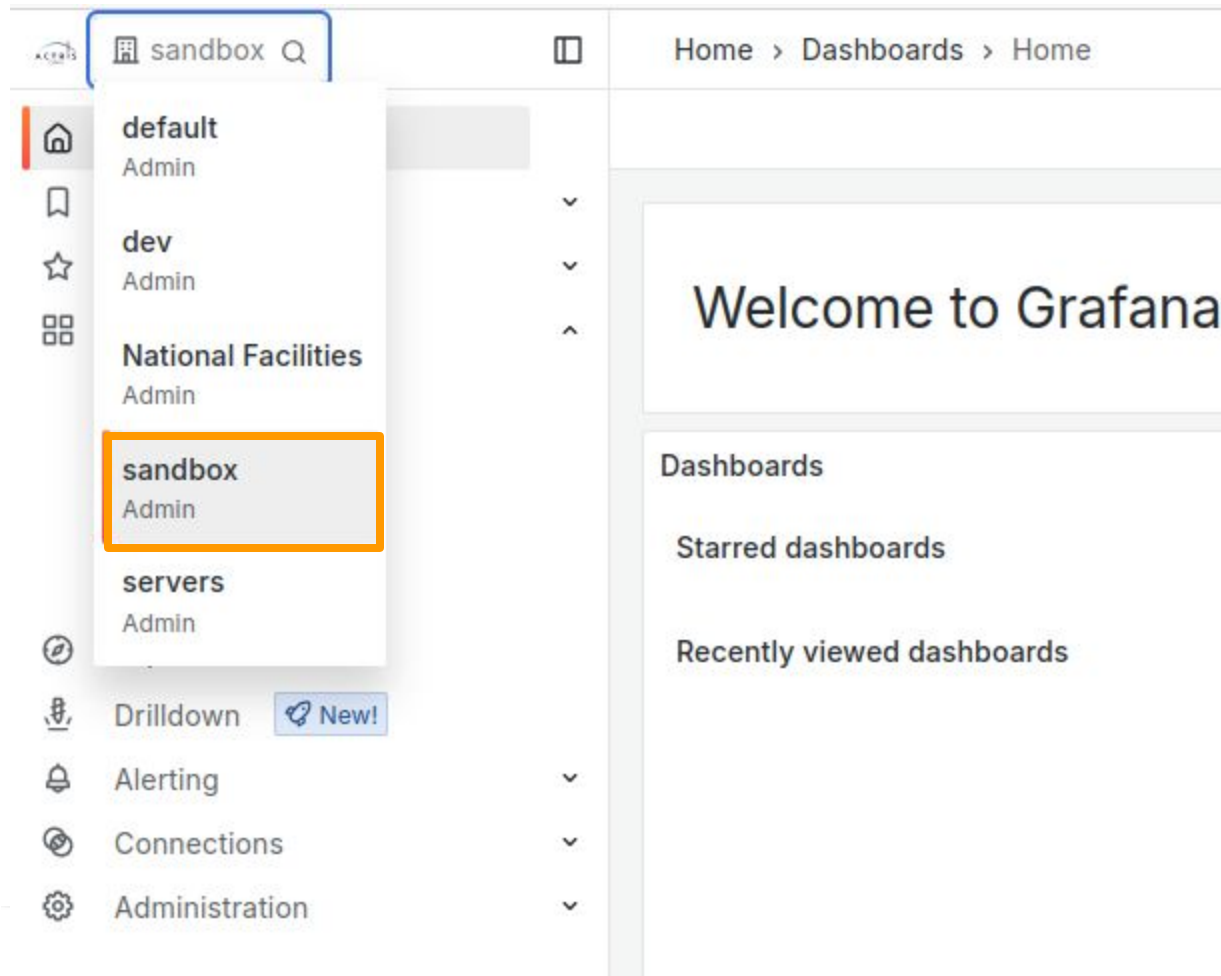
New ^

New dashboardNew folderImport

<input type="checkbox"/>	Name	Tags
<input type="checkbox"/>	> <input type="button" value="Folder icon"/> palaiseau	

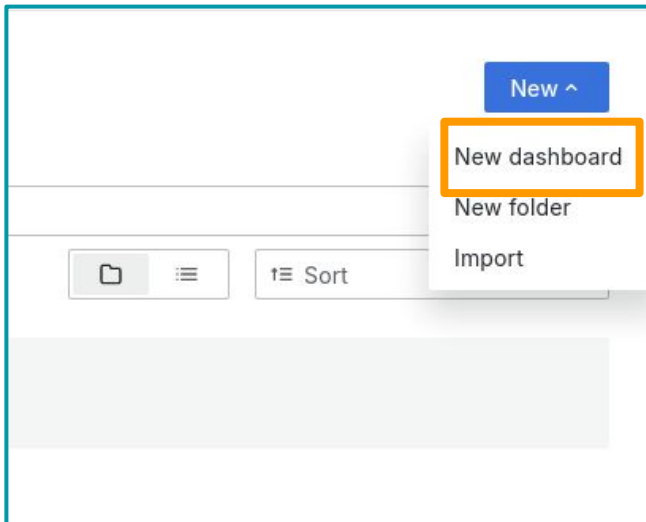
Build your own dashboards (1/7)

- For this session, you have a **sandbox** organization available where you have **editor** rights
- Switch organization, got to dashboard menu

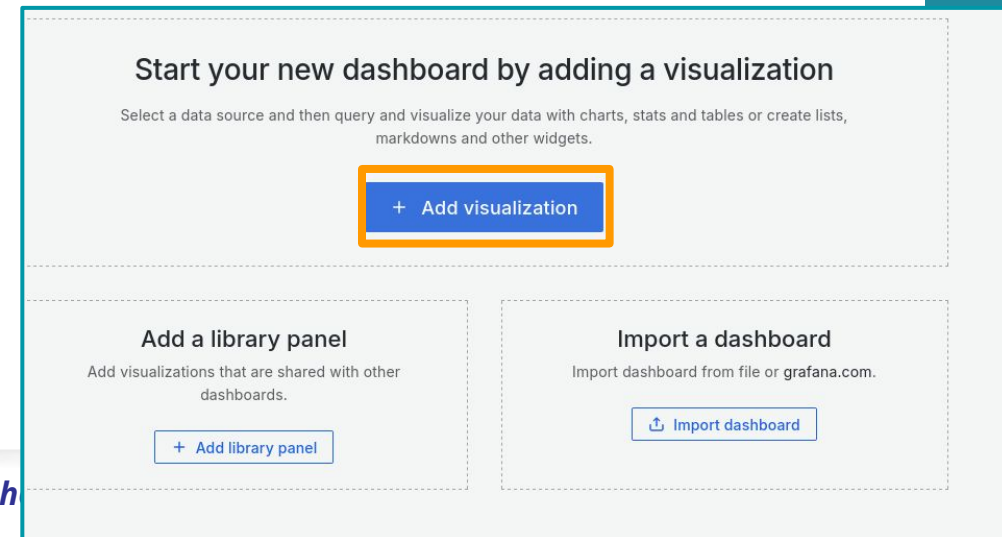


Build your own dashboards (3/7)

- 2 data sources available
 - influxdb CCRES influxQL
 - Default one
 - Easiest to use with grafana
 - influxdb CCRES flux
 - Only needed for special requests
 - for example the list of parameters available for one type of instruments
- To create a dashboard
 - Go to **dashboards** menu and click on **New** and **New dashboard**
 - Click on **Add visualization**



CCRES/CLU Training sch





Build your own dashboards (4/7)

- Select **influxdb CCRES influxQL**

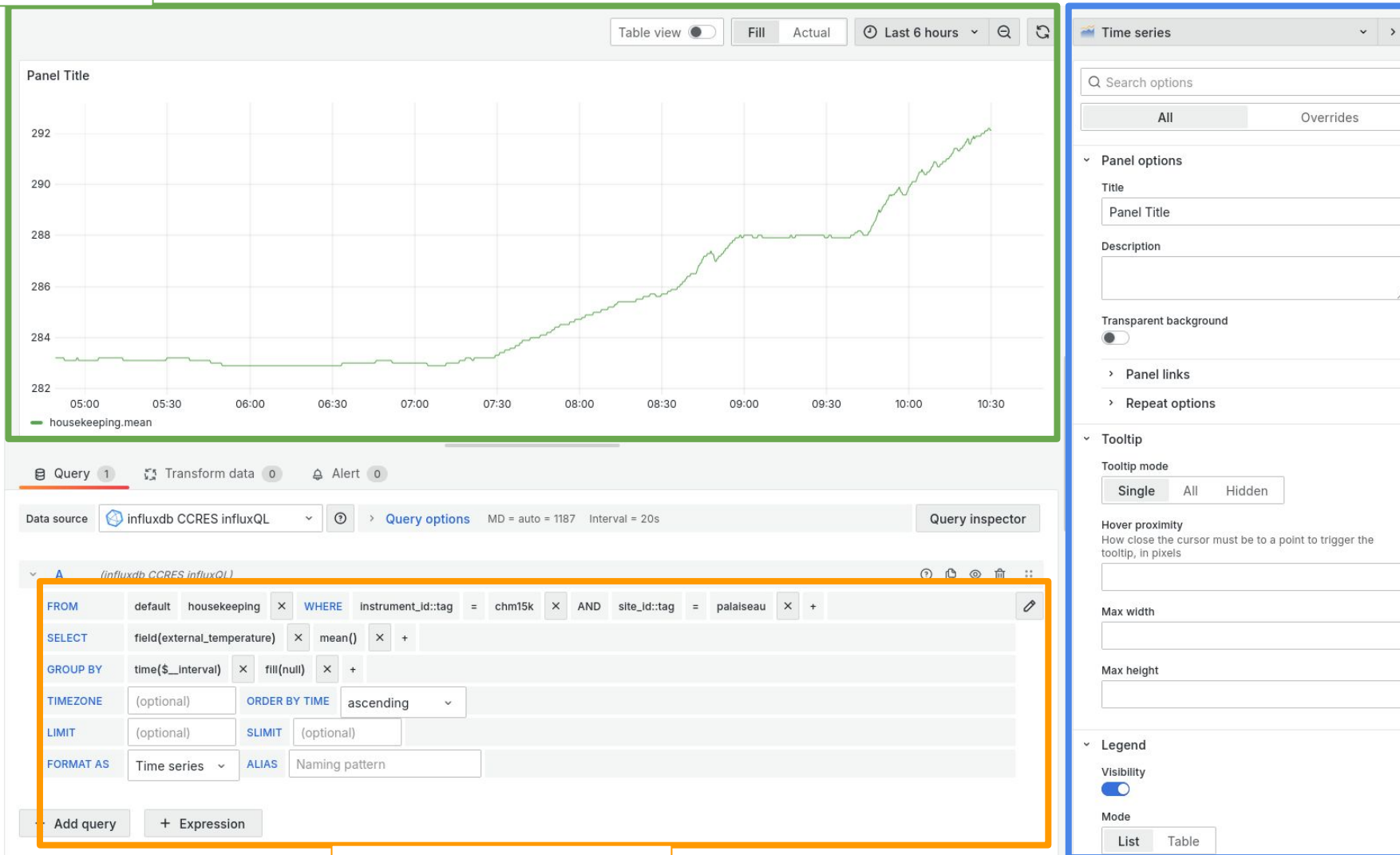
Select data source

Q Select data source

	influxdb CCRES influxQL	default	InfluxDB
	InfluxDB CCRES flux		InfluxDB

previsualization

Build your own dashboards (5/7)



type of plot

data request

Build your own dashboards (6/7)

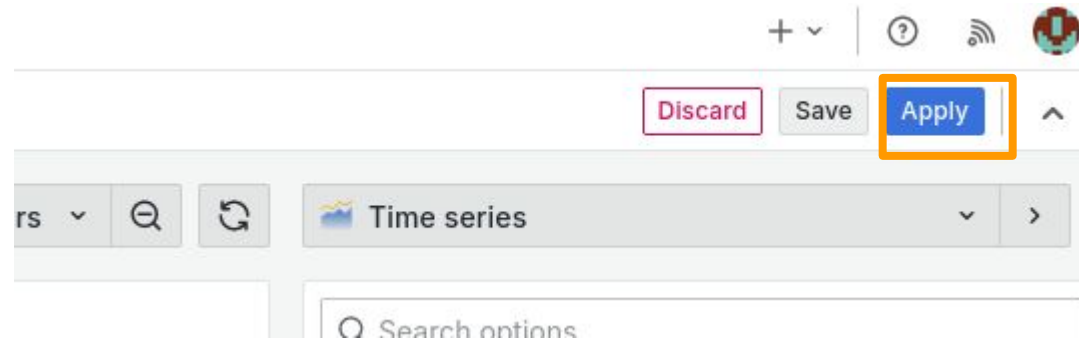
- Grafana doesn't know how to filter variables based
 - *instrument_id*, *instrument_pid* or *site_id*
- Dashboard “List instrument variables” contains lists of variables available by type of instrument

▼ A (influxdb CCRES influxQL)

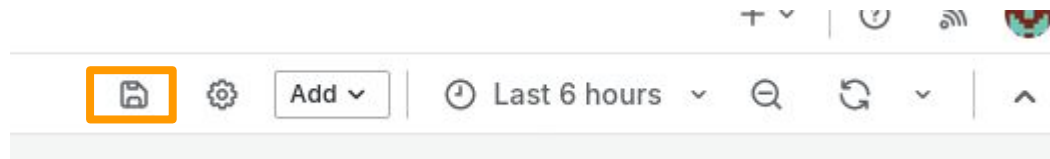
FROM	default	housekeeping	×	WHERE	instrument_id::tag	=	chm15k	×	AND	site_id::tag	=	palaiseau	×	+		
SELECT	field	external_temperature	×	mean()	×	+										
GROUP BY	time(\$__interval)	×	fill(null)	×	+											
TIMEZONE	(optional)			ORDER BY TIME	ascending											
LIMIT	(optional)			SLIMIT	(optional)											
FORMAT AS	Time series	▼		ALIAS	Naming pattern											

Build your own dashboards (7/7)

- Click **Apply** when the plot is done



- Never forget to **save** your dashboards



Questions & Feedbacks

- Alerts in case no data are transmitted to cloudnet

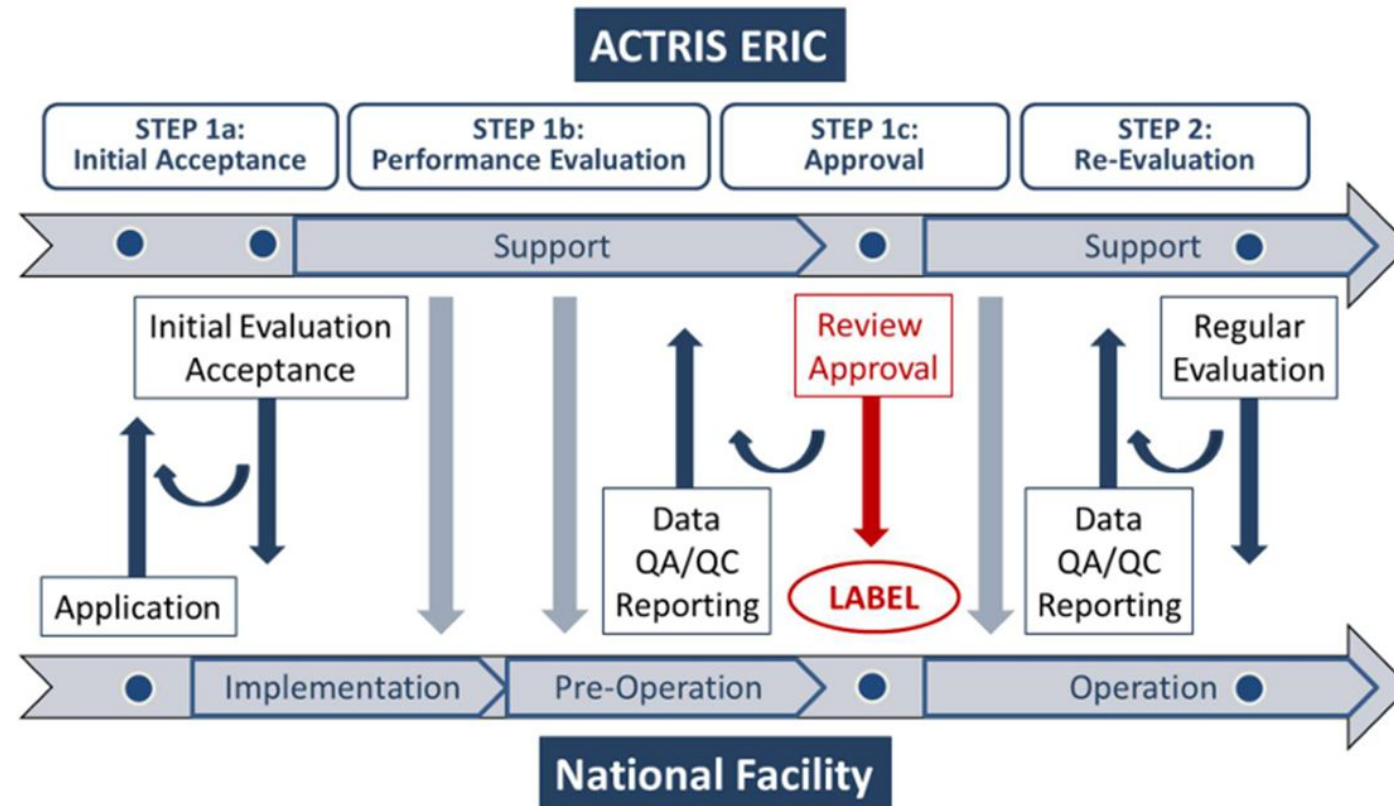
Data Quality (ReOBS)

J-F Ribaud (IPSL)

ACTRIS labelling process

A stepwise labelling process to monitor the progress of the National Facilities

→ long journey...



ACTRIS labelling process

- **Step 1a: Initial acceptance (duration: up to NFs)**

- General feasibility check, collect of information on variables, instruments and personnel
- Compliance with CCRES requirements

- **Step 1b: Performance evaluation (duration 2 years)**

- Data flow and operation support schedule created
- Tracking of NF data
- Upgrade of the facility (if necessary → duration longer than 2 years)
- Compliance with CCRES/CLU data requirements

*NF submit data,
metadata, HKD data to
CLU*

*• CCRES and CLU are
developing and
implementing*

*- Daily diagnostics and
visualisation of HKD*

- Monthly reports of HKD

*- Quality control of
metadata
conformity*

*- Quality tests and control
of geophysical data*

- **Step 1c: Approval**

- Full label is granted.
- Signature of ERIC and NF agreement.

- **Step 2: Re-evaluation**

How do we proceed ?

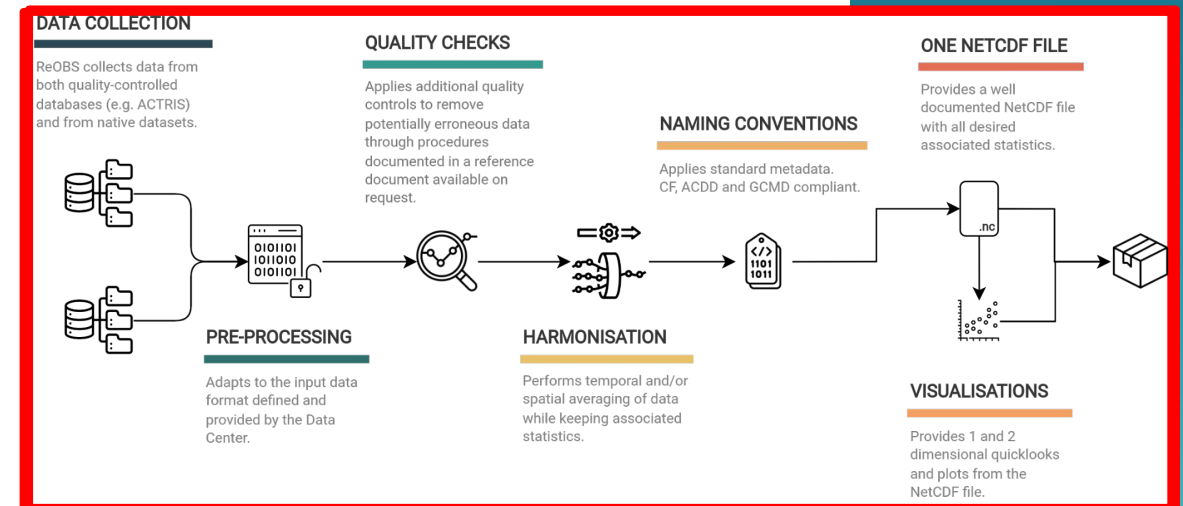
Starting point

- Use the the wealth of information & data available on Cloudnet

2 levels of assessment

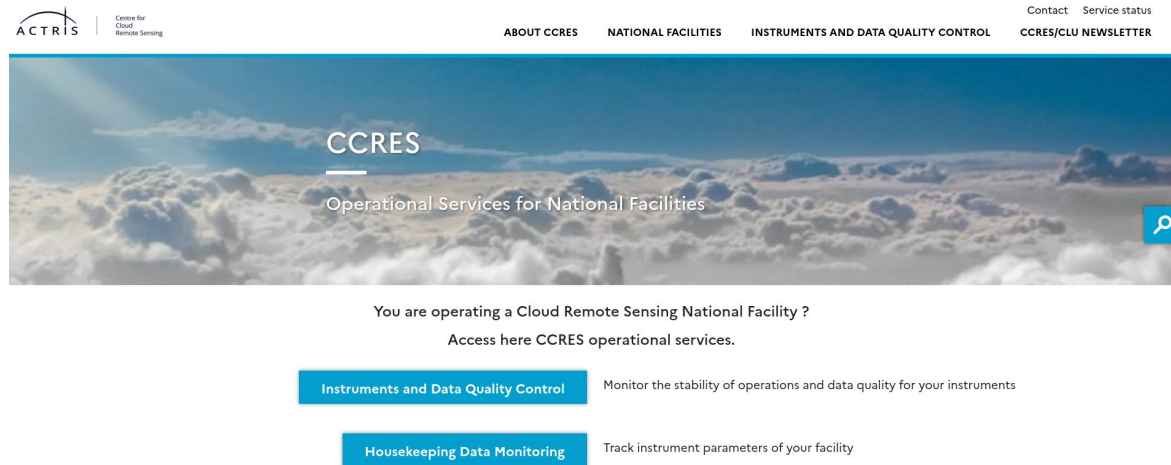
- **Data Availability**
 - NFs' files uploaded to Cloudnet
 - check if minimum of data coverage
 - Information provided by CLU (now available)
- **Data Quality**
 - **Use of ReOBS tool (Chiriaco et al., 2018) to synthesize all products into a single .nc with temporal resolution 1h and same vertical grid**
 - **Additional QCs are used (generally more restrictive flags/status associated with initial products)**

JSON	Raw Data	Headers
Save	Copy	Collapse All Expand All Filter JSON
uuid:	"a871bac7-7c86-44ea-985c-4d3ddd396f3a"	
version:	" "	
pid:	"https://hdl.handle.net/21.12132/1.a871bac77c8644ea"	
dvasId:	null	
volatile:	true	
tombstoneReason:	null	
legacy:	false	
measurementDate:	"2025-04-09"	
checksum:	"8d1cb5c8732ccdbf008983fbc3367d0eddb086aee7e76a6b005f3536212cb88"	
size:	"8515893"	
coverage:	0.85520834	
format:	"HDF5 (NetCDF4)"	
errorLevel:	"info"	
createdAt:	"2025-04-09T01:25:19.623Z"	
updatedAt:	"2025-04-10T04:57:55.413Z"	
dvasUpdatedAt:	null	
startTime:	"2025-04-09T00:00:15.000Z"	
stopTime:	"2025-04-09T23:59:44.000Z"	
instrumentPid:	null	
site:		



Monthly visualization

Before the notebook:



INSTRUMENTS AND DATA QUALITY CONTROL

Access to « DCR/DD Calibration and stability monitoring », « MWR stability monitoring » and « Monthly reports » for the different sites.

DCR/DD Calibration and Stability
monitoring

MWR
Stability

Monthly report for labelling
step1b

<https://ccres.aeris-data.fr/en/data-visualization-monthly/>

Explore ReOBS file

Notebook



Thank you !