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Status of the OPAR-St Paul Maido Station in Reunion Island

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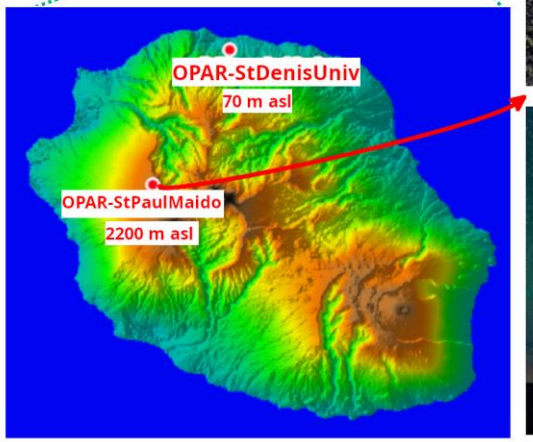
CCRES/CLU Autumn Workshop, Evora, 22 October 2025

Introduction of OPAR (Observatoire de Physique de l'Atmosphère de la Réunion)

Presentation of OPAR-StPaulMaido NF



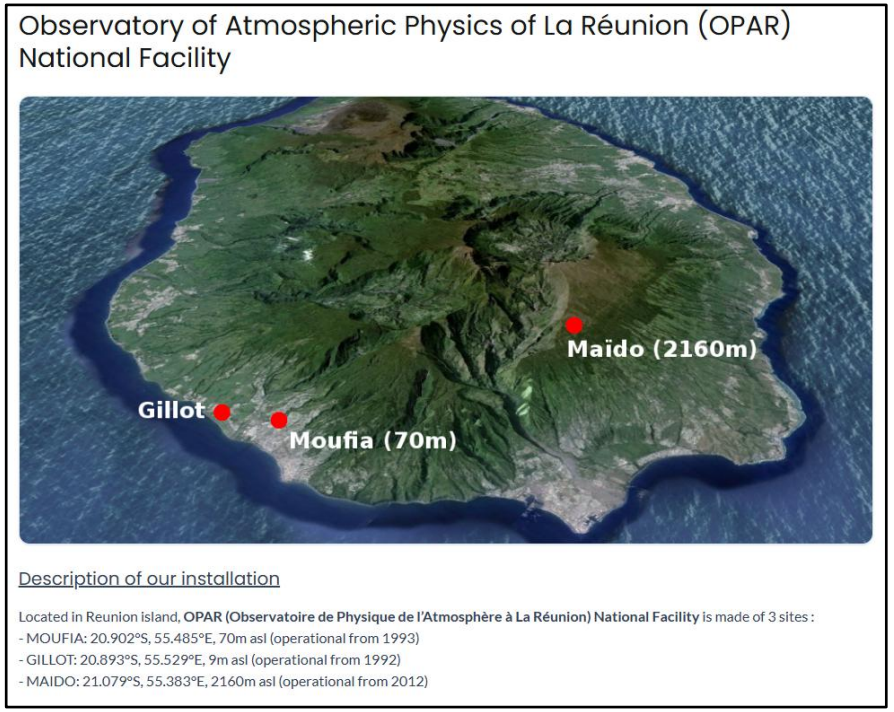
- La Réunion (21°S, 55°E), is a small **tropical island** located in the middle of the south- west Indian Ocean, affected by southeasterly trade winds near the ground, and westerlies in the free troposphere.
- La Réunion is far-off the main anthropogenic pollution sources and local pollution is very sparse.
- OPAR is made of 3 sites, two of which are located on the coast of the northern part of the island, the 3rd is located at Maido Peak at 2200m asl.

Main difficulty

We are far

- Difficulty to plan for DCR Calibration via calibration transfer method (will the reference BASTA keep his calibration constant after travelling?)

- Difficulty to share equipment (import/export via customs), for example the dark current measurement optical termination hood

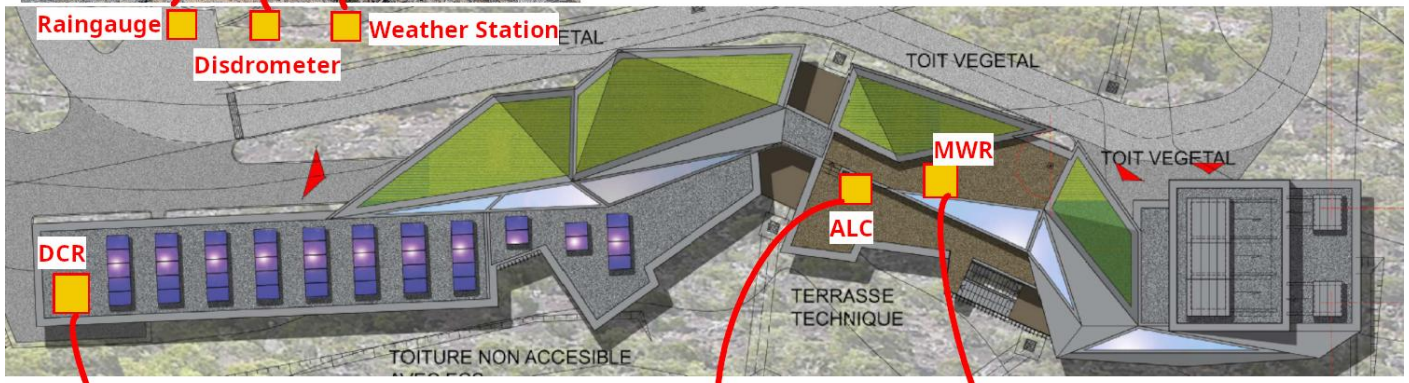


But ...

- Some opportunities exists to come via the IRISCC 2nd Open Call for transnational access

https://catalog.isia.cnrs.fr/catalog/20/installations/281

Localisation of CCRES Instruments



Hopefully coming soon

- 35 GHz DCR
- Doppler Wind Lidar

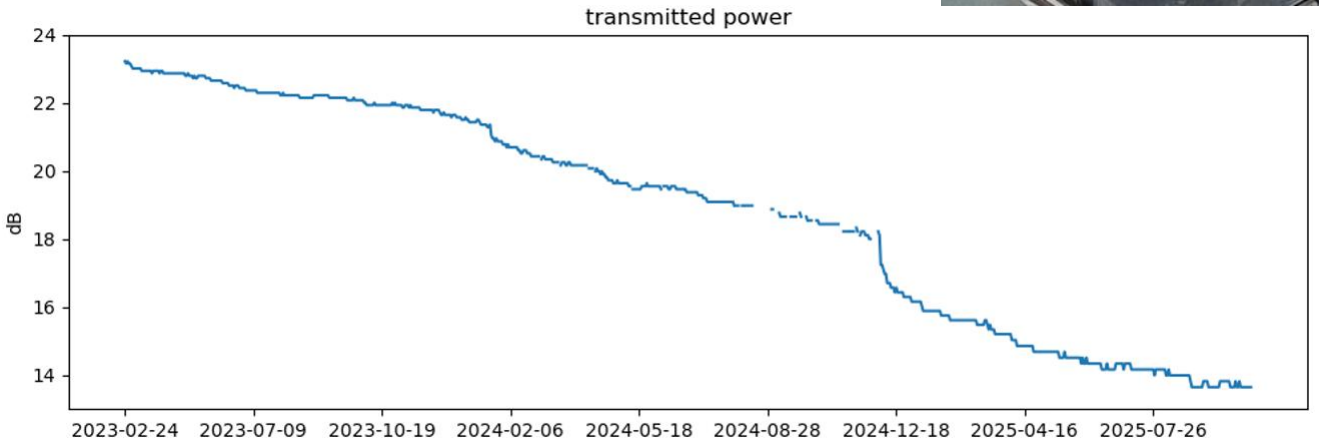
About Instruments SOP application

DCR - BASTA FMCW 94 GHz Doppler Cloud Radar :

- The monitoring of transmitted power via the power diode shows a strong decrease with time, we fear a loss of sensitivity with time. (see figure below)

- Water entered during last cyclone season

  => the radar is now on UPS and blower should be installed soon.



About Instruments SOP application

MWR – RPG HATPRO G5:

- Due to the remoteness of the station, the <u>delivery of LN2 is complicated</u> specially if we should consider the atmospheric conditions necessary for the calibration
- Despite the last calibration and radome replacement in September 2025, we still have some **flagged data on BT**.
  - Using mwrpy, we see that BT observed minus retrieved is high (see figure on the right)
  - Maybe some problems in the Retrieval files (as we can see on the screenshot below lat/lon/alt in RET file is wrong)
- Issues with Water entered during last cyclone
- Issues with Host PC Hard drive => Replacement PC have been ordered

```
# ------------------------------------------------------------------------------
# - Station number           : 35074148
# - Station name             : FR-ERA-LaReunion
# - Station lat / lon        : -21.000 /  55.500 (z = 1545.0 m)
# - Station LWC Threshold/use:  95.000 % and use flag = 01
# - Station RH  corrections  :   1.150,   0.000,   0.000,   0.000,   0.000
# - Station LWC auto controls:  65.000, 150.000,   0.000,   0.000
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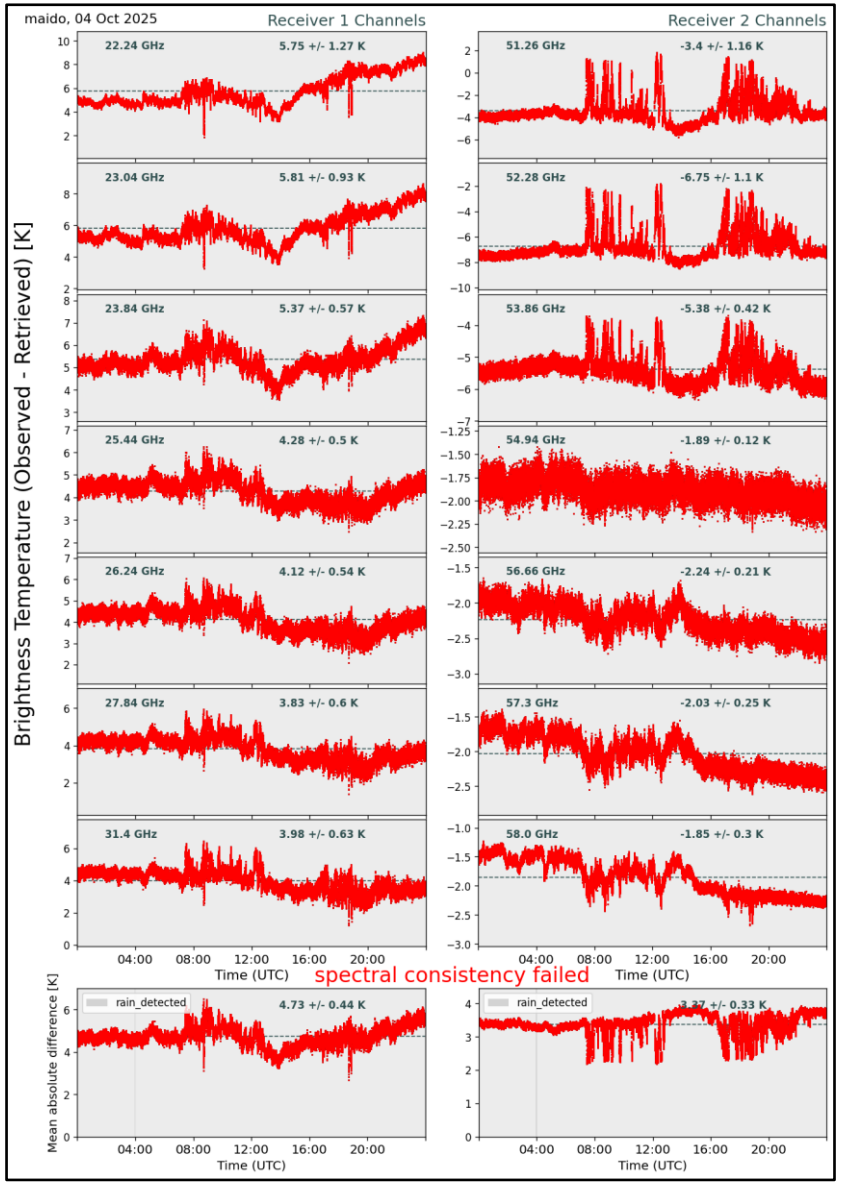


About Instruments SOP application

ALC – Campbell Scientific CS135 :

- Still working but getting old and no funding to renew for now, we keep in mind the budget to replace by CL61
- Can't measure dark currents because we need a Vaisala optical termination hood for the CS135
- Water entered during last cyclone.

Disdrometer – OTT Parsivel²:

- PyAtmosLogger sometimes can't write in new file (windows), so we need to kill the program to restart every day at midnight and it works.
- We sometimes have some freeze on the industrial PC, we are investigating.

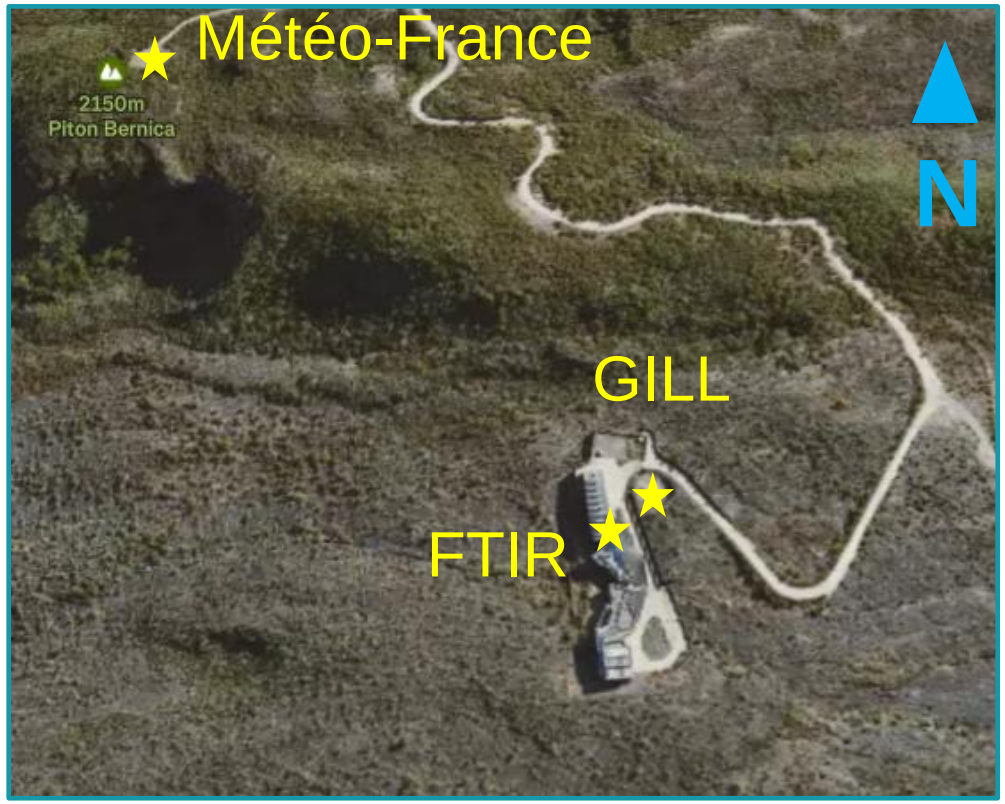
About Instruments SOP application

Weather station – GILL METCONNECT ONE:

- We asked the support from national weather service for sensor calibrations, but it might be difficult since a station is located 333m from the observatory.

- Wind measurement at 2m AGL is masked by the building, we are trying to install a 10m mast, but we need to have an agreement from the national forest office.

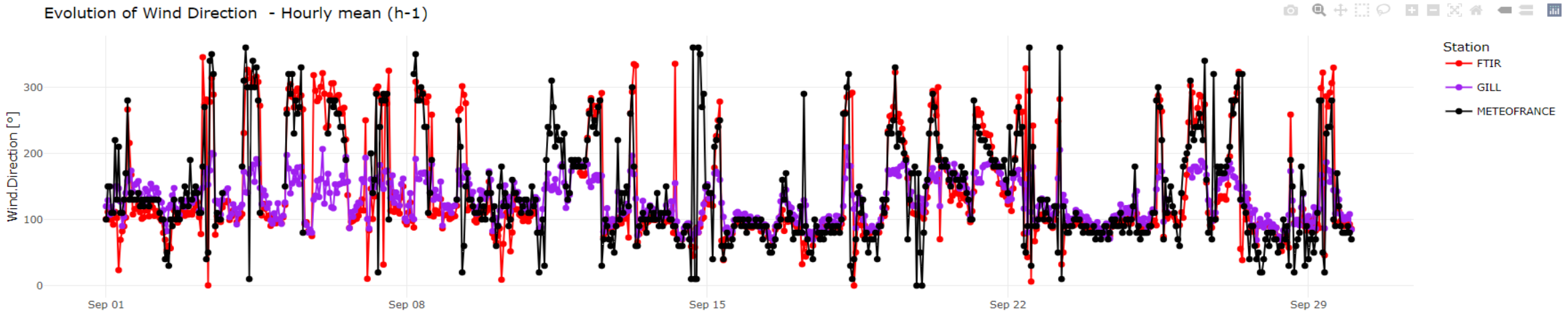
Station name	Location	High of wind measurement
Météo-France (Piton-Maïdo)	Piton Bernica	10m
Vaisala WXT510 (FTIR)	Roof of Maïdo Observatory	4m
GILL Metconnect ONE(CCRES)	Ground	2m

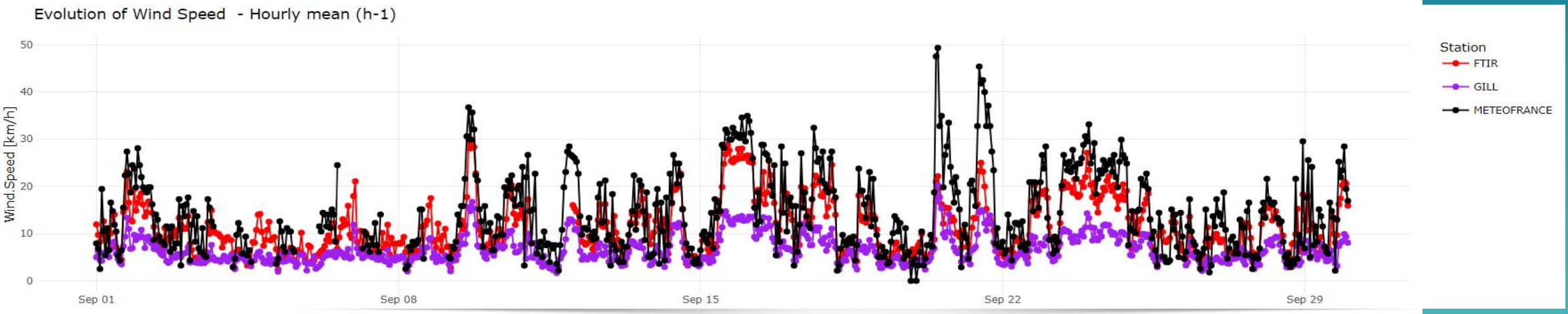


About Instruments SOP application

Weather station – GILL METCONNECT ONE:

- Comparison of 3 weather stations :





About Instruments SOP application

Raingauge – OTT Pluvio² L:

- The variable used in the OTT Pluvio2 rain gauge data file for the rain rate is not detecting the low rain rates (below 6mm/h). It is there to show rain rate in strong events (see screenshot from the manual below)
- Should we add a calculated rain rate derived from rain accumulation measurement ?

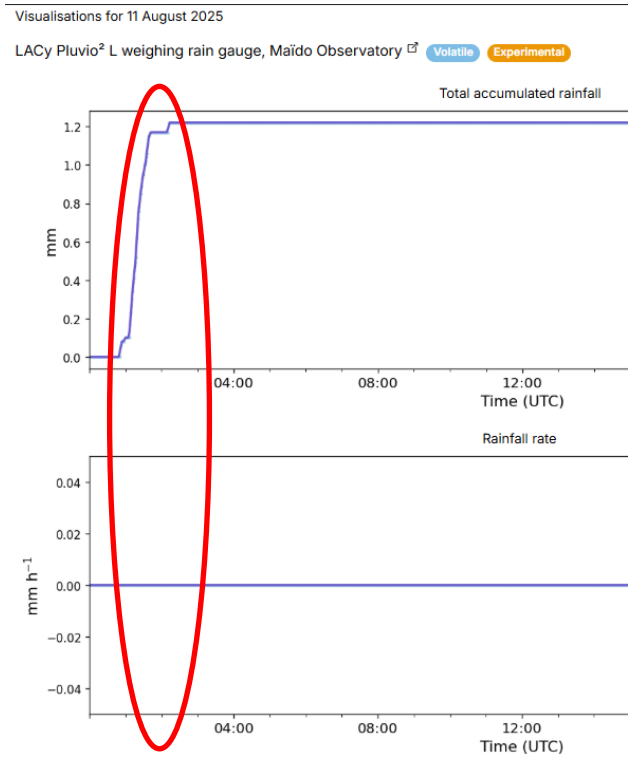
4.1 Measured value output to the SDI-12 and RS-485 interfaces

Intensity RT

Moving precipitation growth over the last minute before the sampling interval. This measured value is particularly suited, for example, for the exact determination of intensity with heavy precipitation and for alarm management, but not for daily and monthly totals.

Output delay:	Real-time output (RT)
Units:	mm/h · mm/min inch/h · inch/min
Threshold:	0.1 mm/min · 6 mm/h
Sampling interval required:	1 minute
Storing interval required:	1 minute

Note: Larger sampling intervals always give the precipitation intensity of the minute just before the sampling interval! For precipitation intensities of < 0.1 mm/min, the OTT Pluvio² L sets the output value to zero. Thus, this output value may not be used for accumulating single intensity values.



About us - contacts

- People involved in CCRES at OPAR are :
  - Joël Van Baelen : joel.van-baelen@univ-reunion.fr : Facility PI / Scientific director of OPAR
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  - David Combemale : david.combemale@univ-reunion.fr : Instrument PI / Instrument technical manager
  - Guillaume Lesage : guillaume.lesage@univ-reunion.fr : Instrument PI / Technical manager of OPAR

- We are open for discussion and collaboration !

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Thank you !

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