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Rain-gauge check / calibration

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Rain gauge check / calibration

Motivations : The goal is to monitor the stability of rain gauge for the cumulated precipitation measurement, necessary to check the accuracy and stability of the disdrometers (used themselves to monitor the stability of the Doppler Cloud Radar)

Outline : We will present here what Meteo-France does at SIRTA observatory and at more than 1000 met stations in France and how it could be applied at the different rain gauges installed in the ACTRIS CRS NF.

Instruments : Two types of rain gauges :

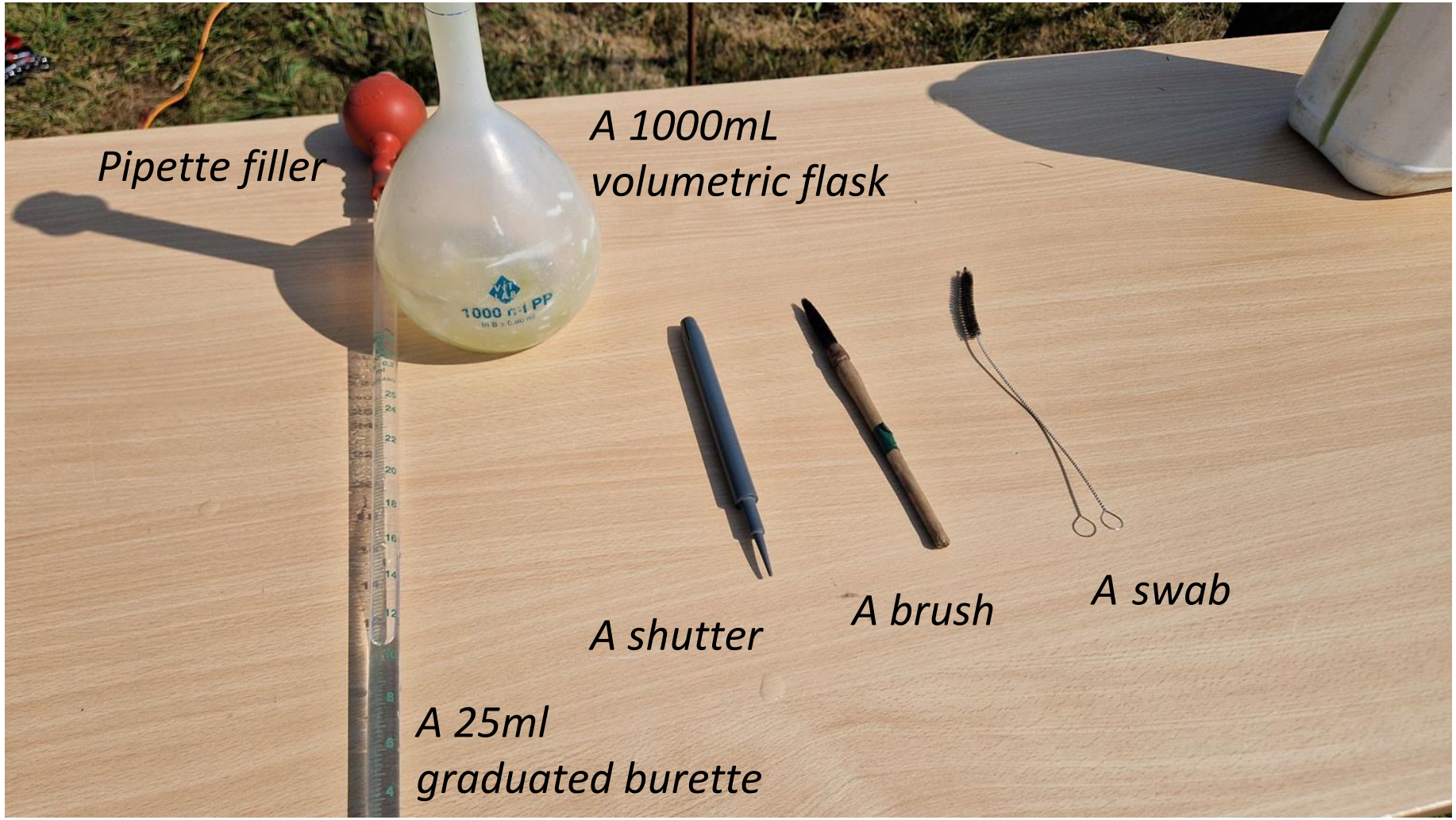
- Tipping bucket rain-gauge (different models)
- Weighing rain gauge (different models)

CCRES objective : develop one check / calibration kit to help NFs to check / calibrate their own rain-gauge

=> *Current calibration in the French Network : Meteo-France checks and adjusts rain gauge every 6 months*

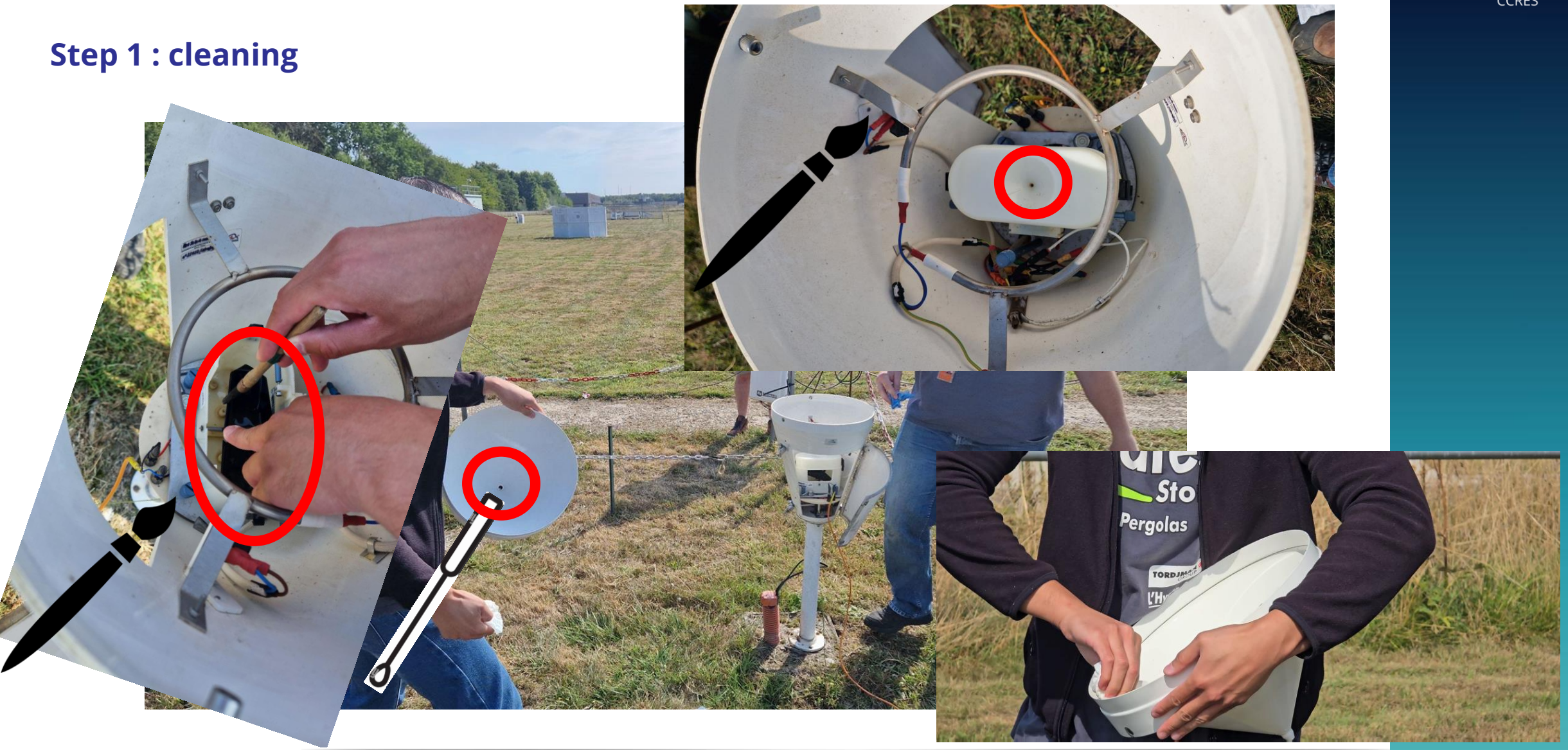
Tipping bucket rain gauge check / calibration

Materials used for this check



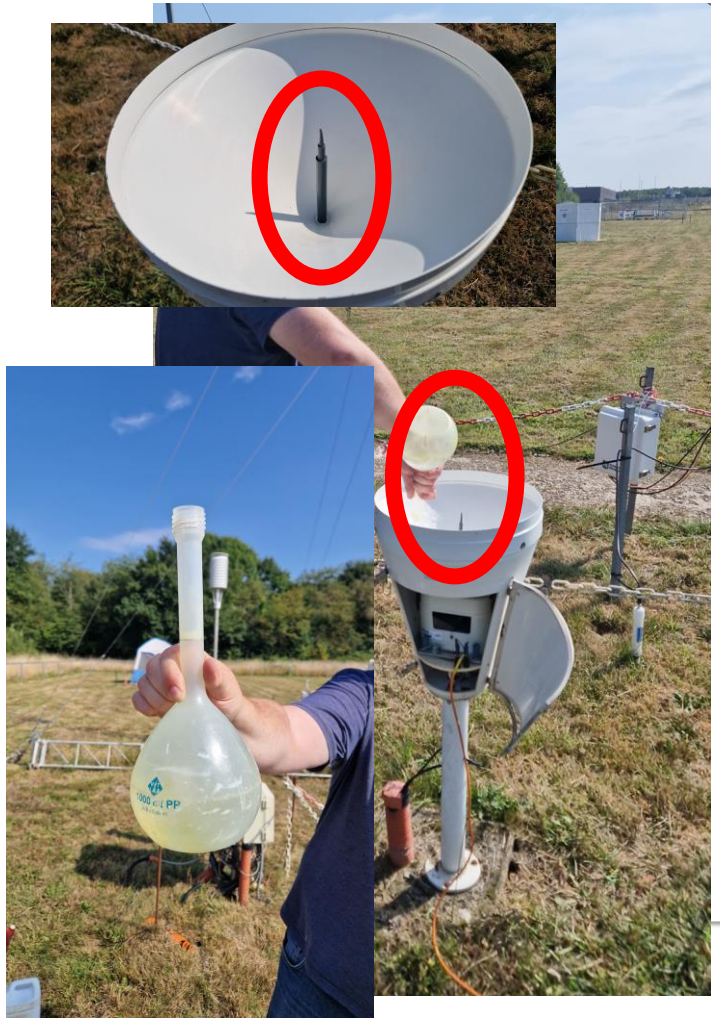
Tipping bucket rain gauge check / calibration

Step 1 : cleaning



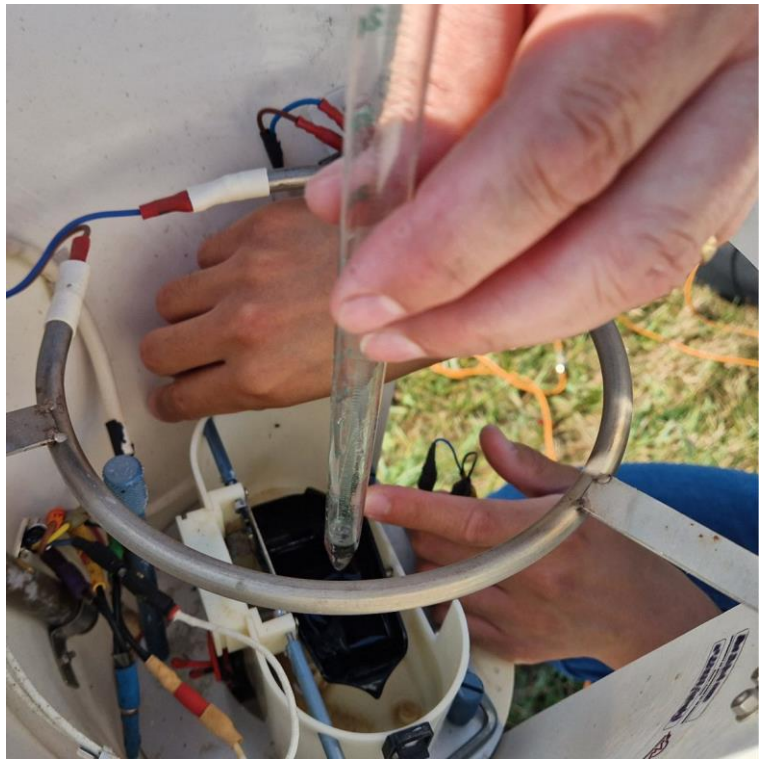
Tipping bucket rain gauge check / calibration

Step 2 : measurement of 1000ml



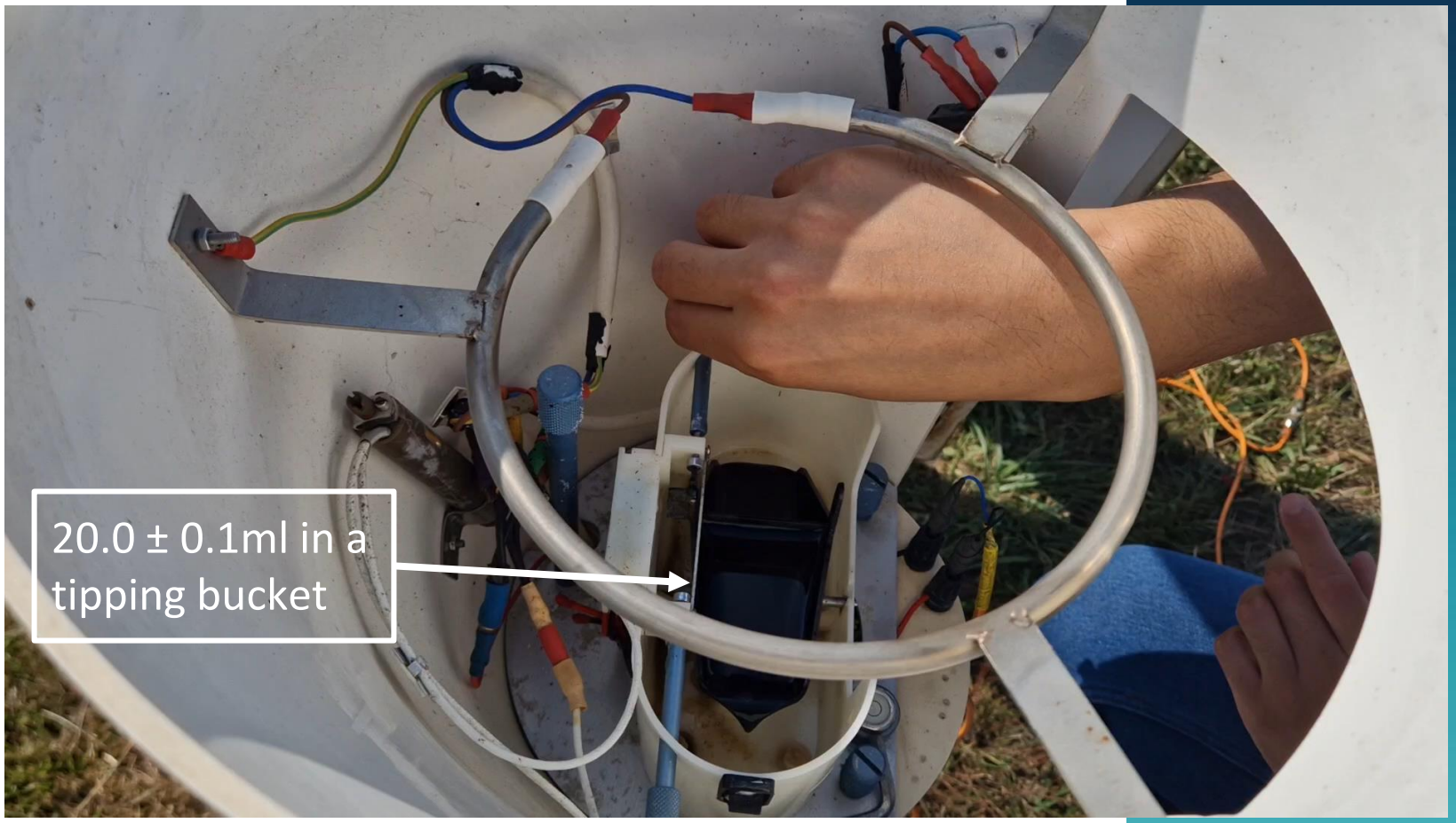
Tipping bucket rain gauge check / calibration

Step 3 : adjustment (if necessary)



Filling the last bucket until it tips

If difference > 5%, we adjust with the adjustment screws

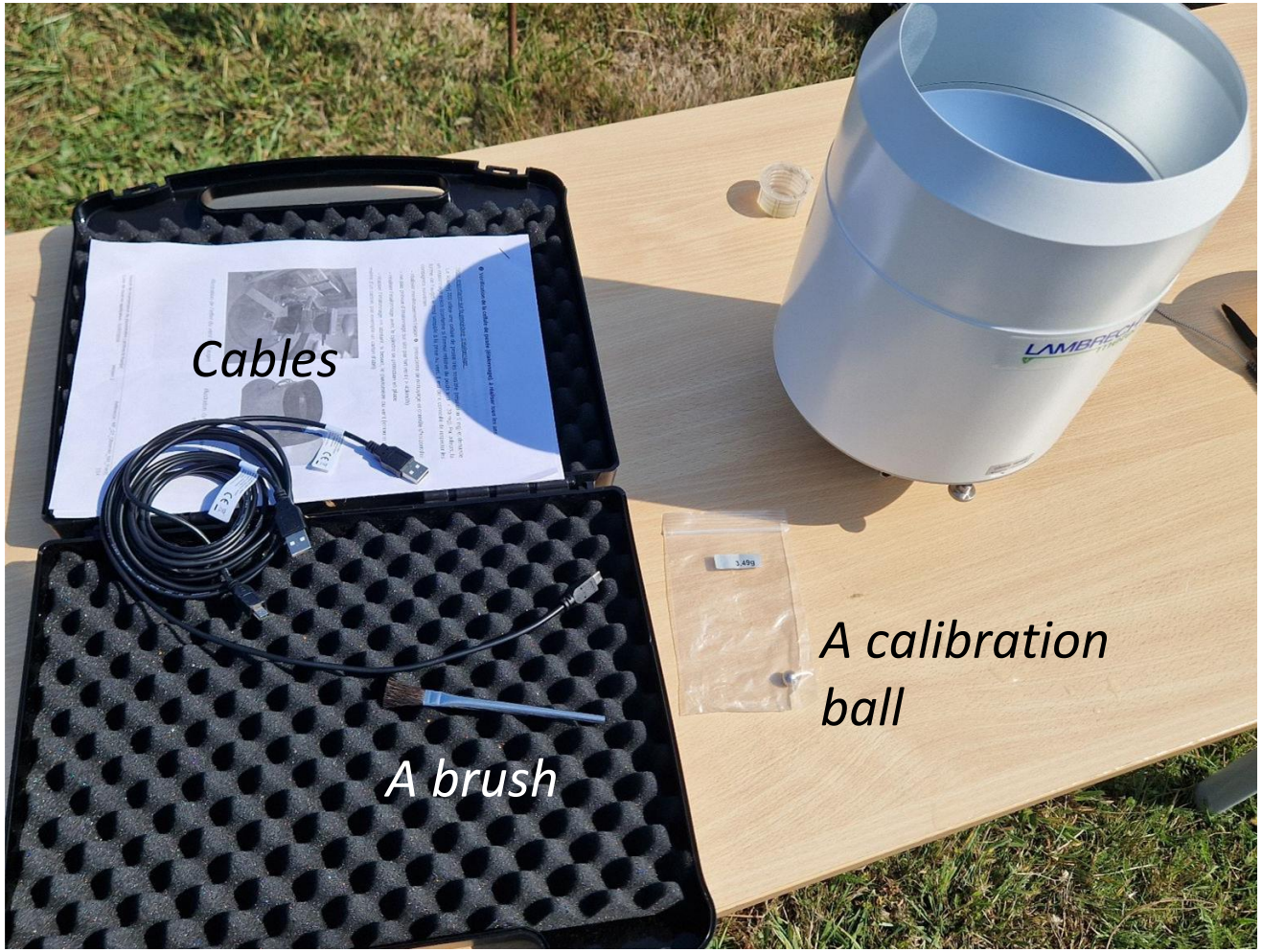


Tipping bucket rain gauge check / calibration

Step 4 : checking (if adjustment)

Weighing rain gauge check / calibration

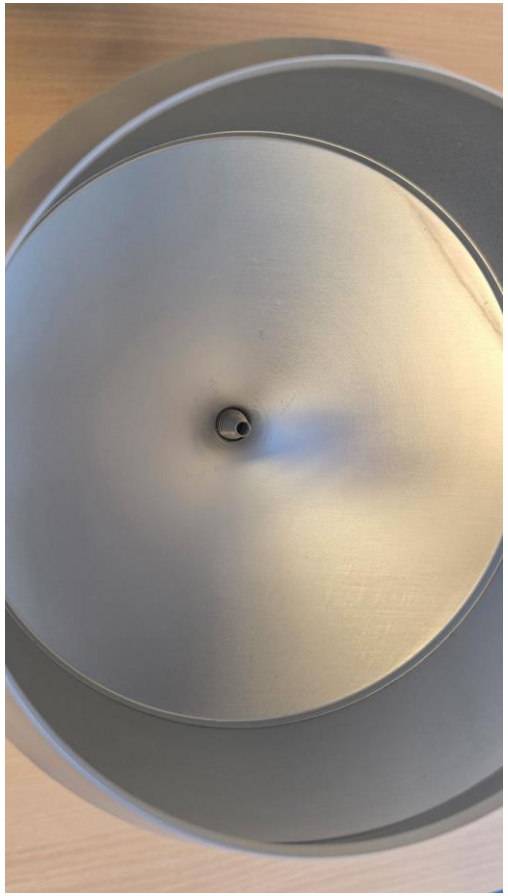
Materials used for this check

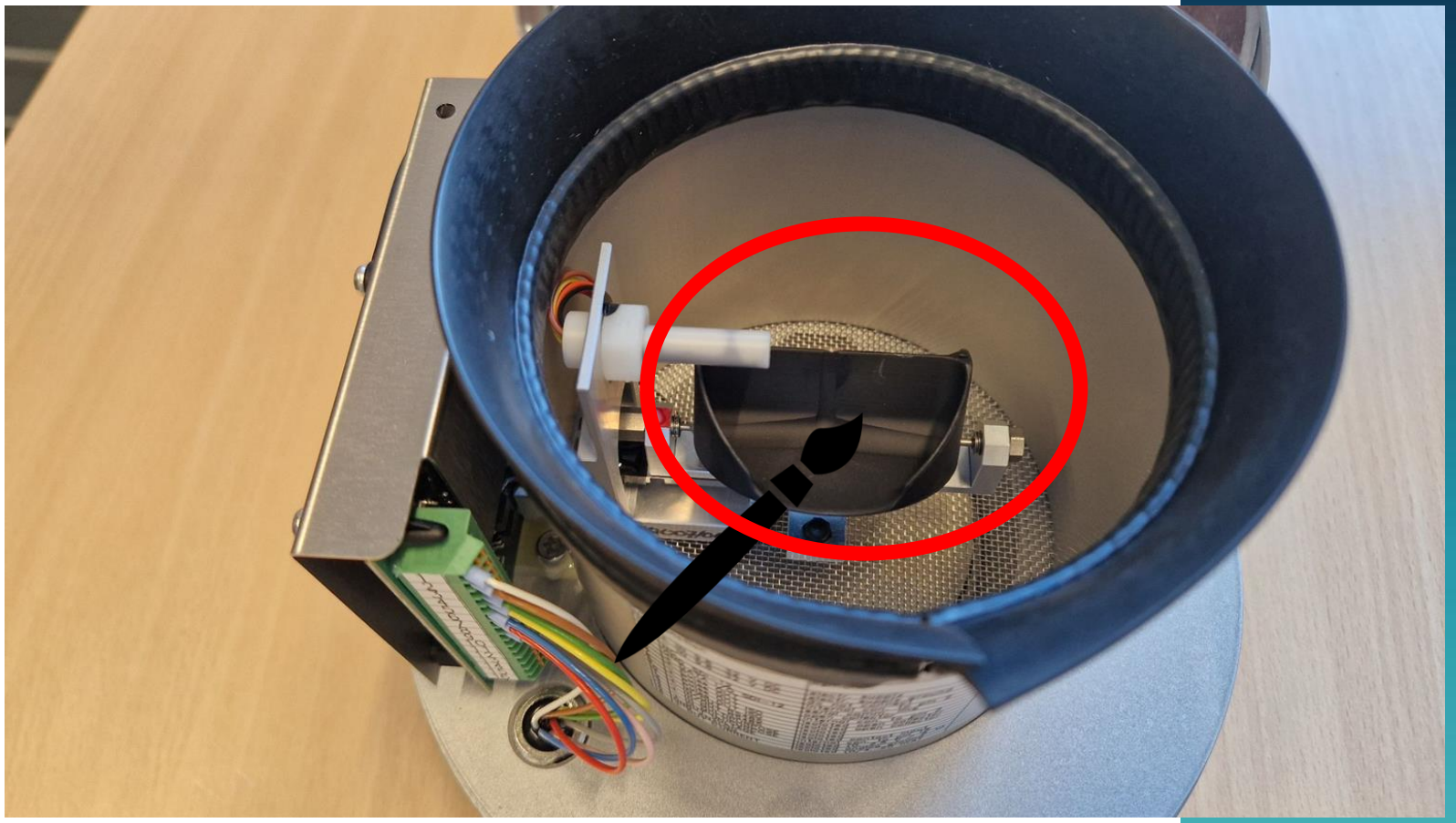


Weighing rain gauge check / calibration

Step 1 : cleaning

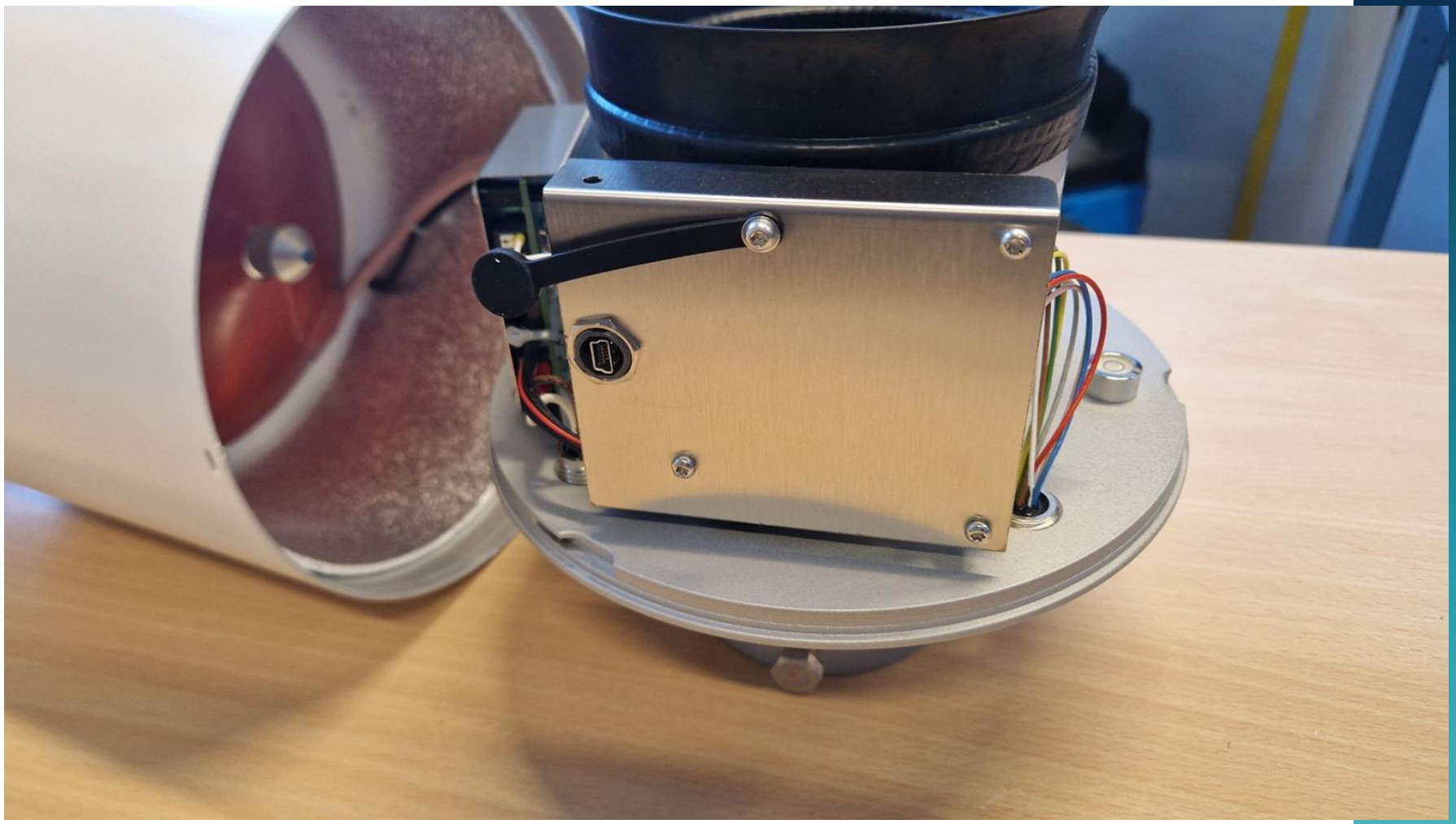
We open the rain gauge and clean the bucket





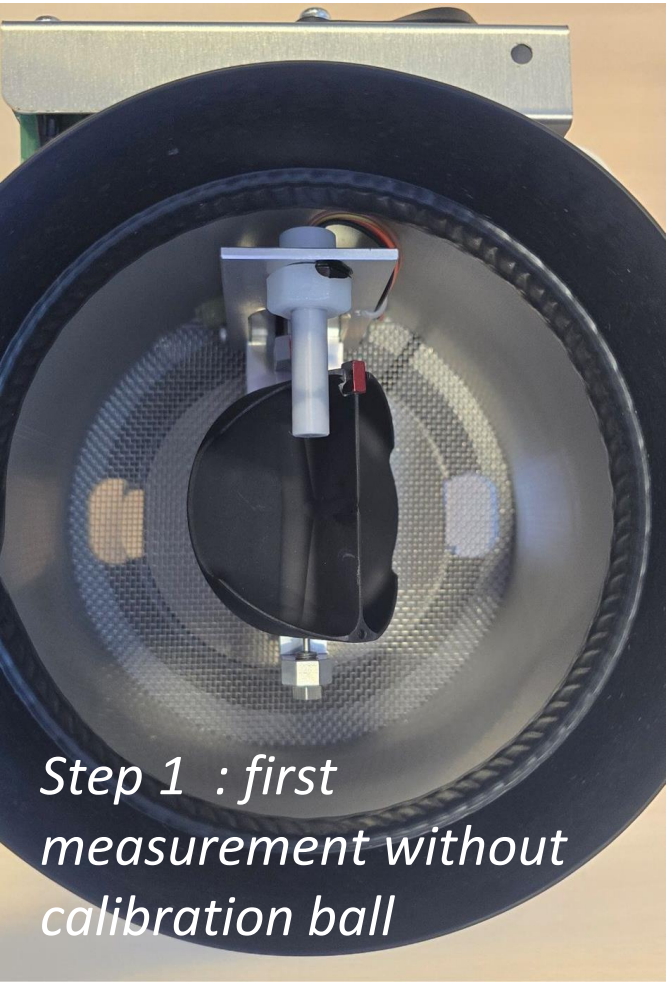
Weighing rain gauge check / calibration

Step 2 : connection to the laptop and run the software *Rain Commander*



Weighing rain gauge check / calibration

Step 3 : calibration with the calibration ball



Step 1 : first measurement without calibration ball

Step 2 : second measurement with calibration ball

Weighing rain gauge check / calibration

Step 4 : check the weight with the software and repeat the operation if necessary

Rain gauge check / calibration

CONCLUSIONS.

We are about developing check / calibration method to insure the stability measurement of rain gauge (tipping-bucket and weighing) :

- list of material ;
- datalogger / cables / software-program ;
- uncertainties ;
- corrective actions if necessary (adjustment screws, manufacturer action ?) ;

These methods have been already validated by Meteo-France but what is done for the different NFs

- Met-service protocol,
- Home-made check,
- NF monitoring / comparisons with other sensors,
- Nothing

Future step : test these kits / methods at several NFs to see the reproducibility, validate the procedures, quantify the stability, improve the protocols

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Thank you !