

QA/QC Meeting

7 Sep 2023

Participants: LH, IF, LS, AS, TB, KMK, FT, PR, PM, SS (10)

Talking Points

- reminder: fluxcoffee notes with lots of details about flux calculations and more are available in Tenaris (Bots/FluxCoffee)
- reminder: make sure to check the plots of a random ec raw data file from time to time
- checking recent webcam images:
 - checking JUV, JH, VPD and SA, site overview
 - checking recent fluxes
- The wind component shows an offset during some time periods at some sites, maybe we can correct this directly in EddyPro (see next slide). This seems to be a recurring issue for CH-CH4.

ALL SITES Recent webcam pictures

CH-AWS

CH-CHA

CH-DAV

CH-DAS

CH-FRU

CH-LAE

CH-LAS

CH-OE2

- **Reminder: FluxCoffee notes** with lots of details about flux calculations and more are available in Teams (Data/FluxCoffee)
- **Reminder:** Make sure to check the plots of a random **EC raw data** file from time to time
- Checking recent webcam images
- Checking SW_IN, VPD and TA, site overview
- Checking recent fluxes
- The wind component w shows an offset during some time periods at some sites, maybe we can correct this directly in EddyPro (see next slide). This seems to be a recurring issue for CH-CHA.

General Info

- **Attendance:** If you are (Tech-)SRP, please attend QA/QC meetings or tell LH if you can't, needed for planning of the meetings.
- **Short statement:** SRP & Tech-SRP: please prepare short statement about your site and post it on the slide together with the plot(s). You can also extend the already available text snippet(s) from previous meetings. (max. 2 sentences)
- **Purpose:** The purpose of QA/QC meetings is to check on current, incoming data. SRPs choose specific issues we should look at together and discuss in the group. Fluxes are checked if the respective SRP wishes to do so.
- **Variables:** There is a list of known variable abbreviations that you can use in case you wonder what an abbreviation means: [Variable Abbreviations](#)
- **Check of EC raw data files:**
 - Recommended check for SRPs and T-SRPS: take a look at EC raw data files and check if they look OK
 - Current EC raw data files are automatically converted to ASCII each day (done by the Python script bico)
 - Files and their plots can be found here, e.g. for CH-LAS:
`gl-processing\CH-LAS_Lae-Subcanopy\20_ec_fluxes\2022\raw_data_ascii`
- **Weekly flux calculations on the RDS:**
 - Please calculate fluxes and check them once per week, or more often if you wish to do so.
 - If you cannot calculate the fluxes, try to find a substitute, e.g. LH.
 - Please move your Level-0 results from the RDS to the respective Level-0 folder.
- **RDS folder:** The folder P:\Flux\RDS_calculations is a temporary folder. Please move Level-0 flux calculations (preliminary fluxes) to the Level-0 folder on gl-processing. For example, for CH-CHA move files to Z:\CH-CHA_Chamau\20_ec_fluxes\2022\Level-0 (gl-processing is mounted as drive Z in this example).
- The RDS now has access to the database. This means that we now have a shared working environment where we can run Jupyter notebooks.
- **FluxCoffee:** separate meetings to discuss data related issues, e.g. flux processing and technical issues, started and will continue to take place. There are extensive notes available in the Data/FluxCoffee group on Microsoft Teams.
- **List of QA/QC Meeting dates:** [QA/QC Meetings 2023](#)



Processing Options

Statistical Analysis

Spectral Analysis and Corrections

Output Files

Raw Processing Options

Raw data processing

Wind speed measurement offsets

U : 0.000 [m/s] V : 0.000 [m/s] W : 0.000 [m/s]

☐ Fix 'w boost' bug (Gill WindMaster and WindMaster Pro only)☐ Angle-of-attack correction for wind components (Gill's only)☒ Axis rotations for tilt correction

Method : Select automatically

Rotation method : Double rotation

Turbulent fluctuations

Detrend method : Block average

Time constant : 350.0 [s]

☒ Time lags compensation

Time lag detection method : Covariance maximization with default

Compensation of density fluctuations

☒ Compensate density fluctuations (WPL terms)☐ Add instrument sensible heat components, only for LI-7500

Surface temperature estimation : Simple linear regressions

☐ Multiple regressions

Day time Night time

Bottom : $T_{air} = 0.944 + T_s + 2.57$ Top : $T_{air} = 1.005 + T_s + 0.24$ Spar : $T_{air} = 1.010 + T_s + 0.36$

Restore Default Values Default values as from Burba et al. (2008)

Other options

☒ Quality check

Flagging policy : Mauder and Foken (2004) [0-1-2 system]

☒ Footprint estimation

Footprint method : Kijun et al. (2004)

Maybe we can correct the the w offset issue during the affected time periods with this setting here?

Restore Default Values

CH-AWS_WEBCAM_M2_2.9_1-202309051230.jpg 2023-09-05 12:30:02



CH-CHA_GF4_1_1-202309051202.jpg 2023-09-05 12:02:01



CH-FRU_GF1_1_1-202309051230.jpg



CH-LAE_PHENOCAM_T1_47_1-202309051230.jpg



CH-DAV_WEBCAM_T1_35_1-202309051200.jpg

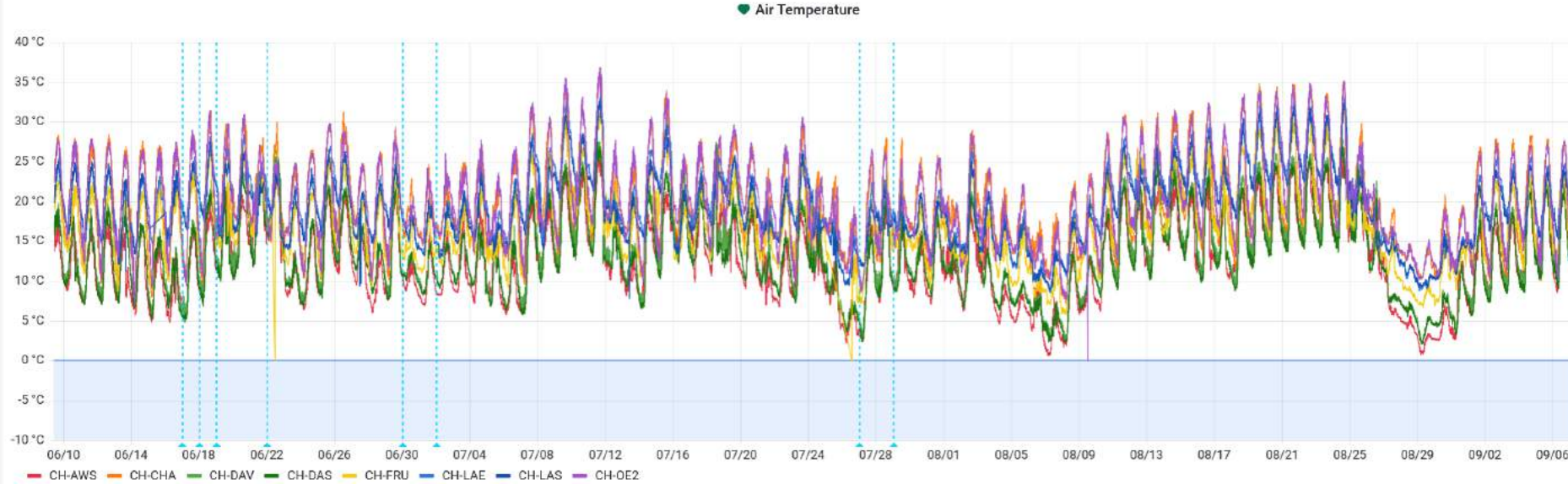


CH-DEZ_PHENOCAM_T2_3_1-202309051200.jpg

Source: [Swiss FluxNet](#)

Air Temperature

- raw data
- no quality checks
- full resolution

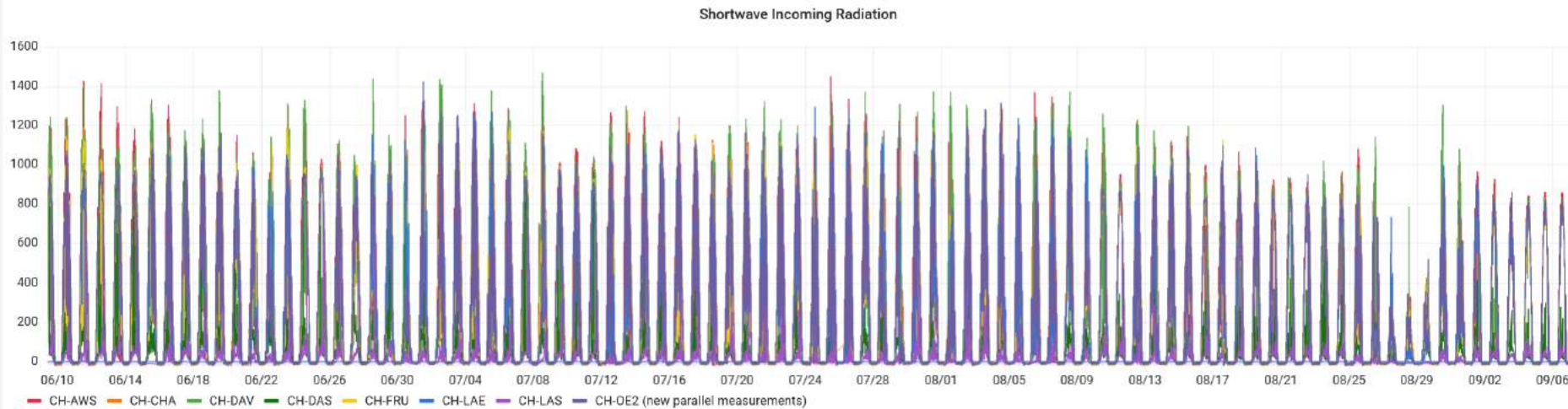


Max

CH-AWS	26.8
CH-CHA	35.8
CH-DAV	28.1
CH-DAS	27.6
CH-FRU	32.6
CH-LAE	33.4
CH-LAS	32.7
CH-OE2	36.9

Shortwave Incoming Radiation

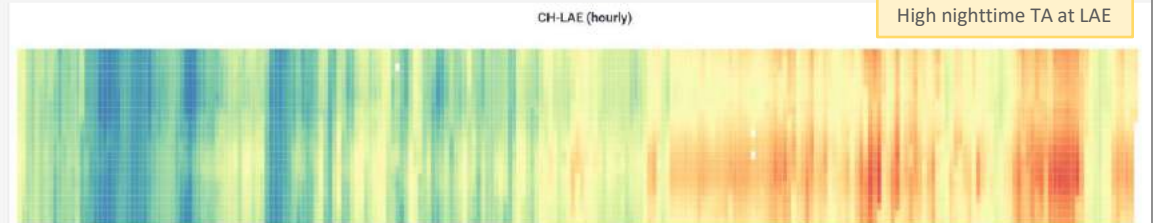
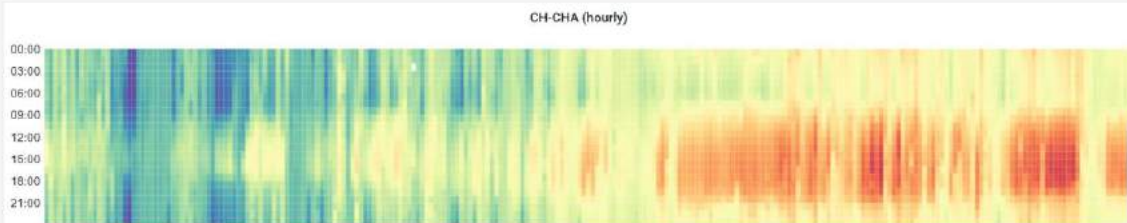
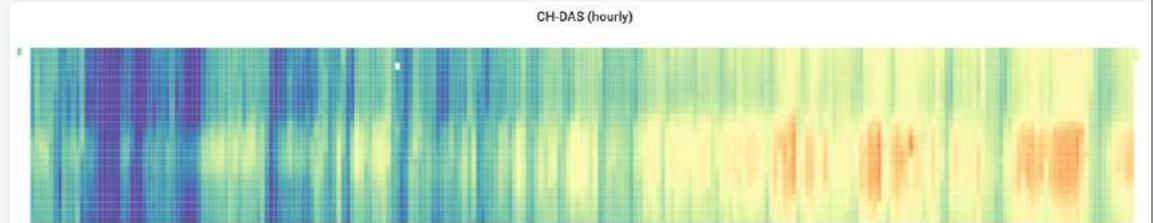
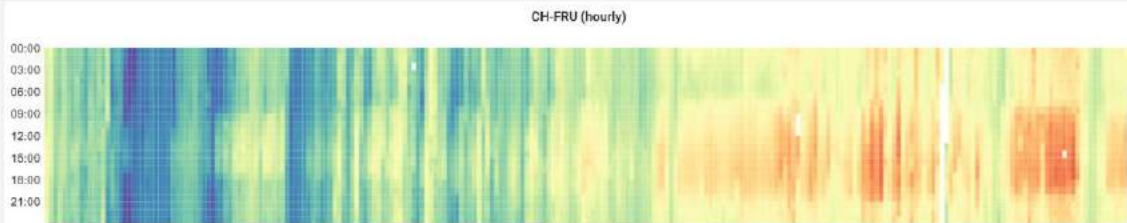
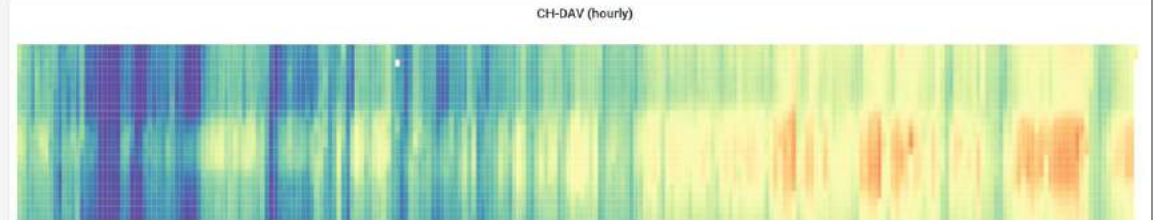
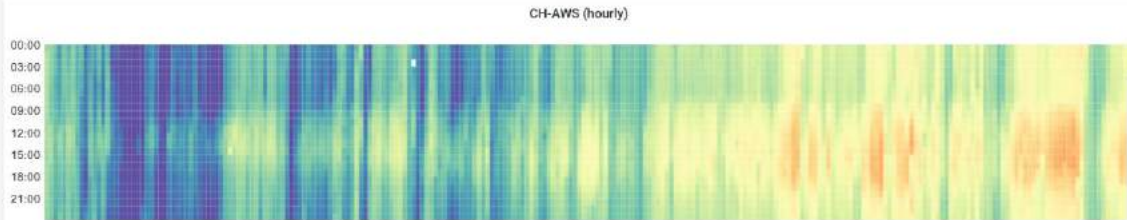
- raw data
- no quality checks
- full resolution



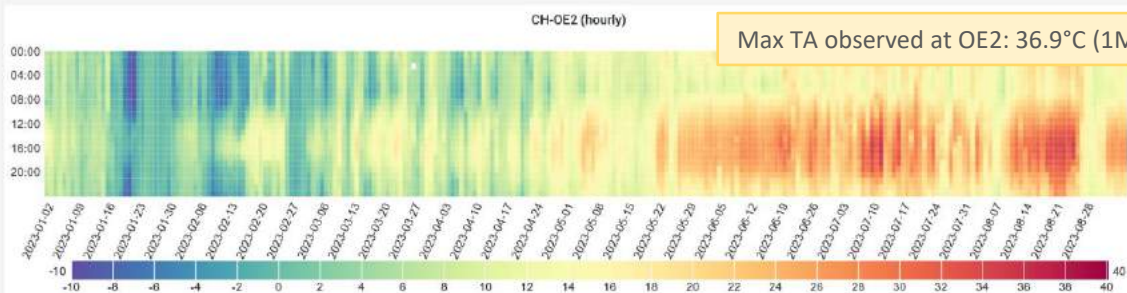
Max

CH-AWS	1449
CH-CHA	1285
CH-DAV	1470
CH-DAS	968
CH-FRU	1197
CH-LAE	1329
CH-LAS	
CH-OE2	1426

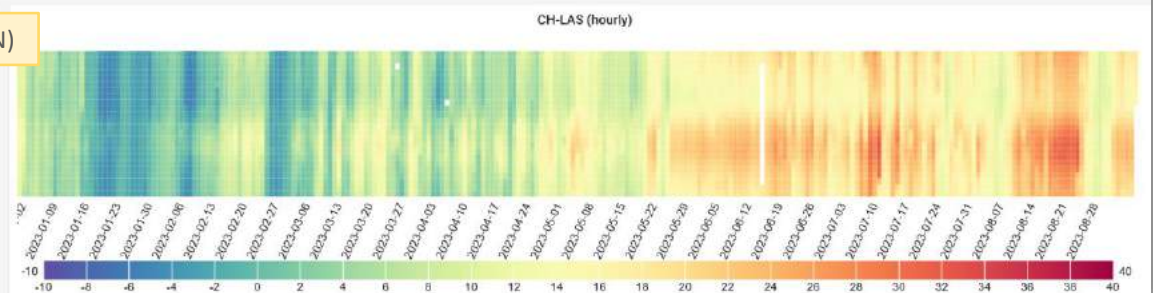
Air Temperature: This year so far ...



High nighttime TA at LAE

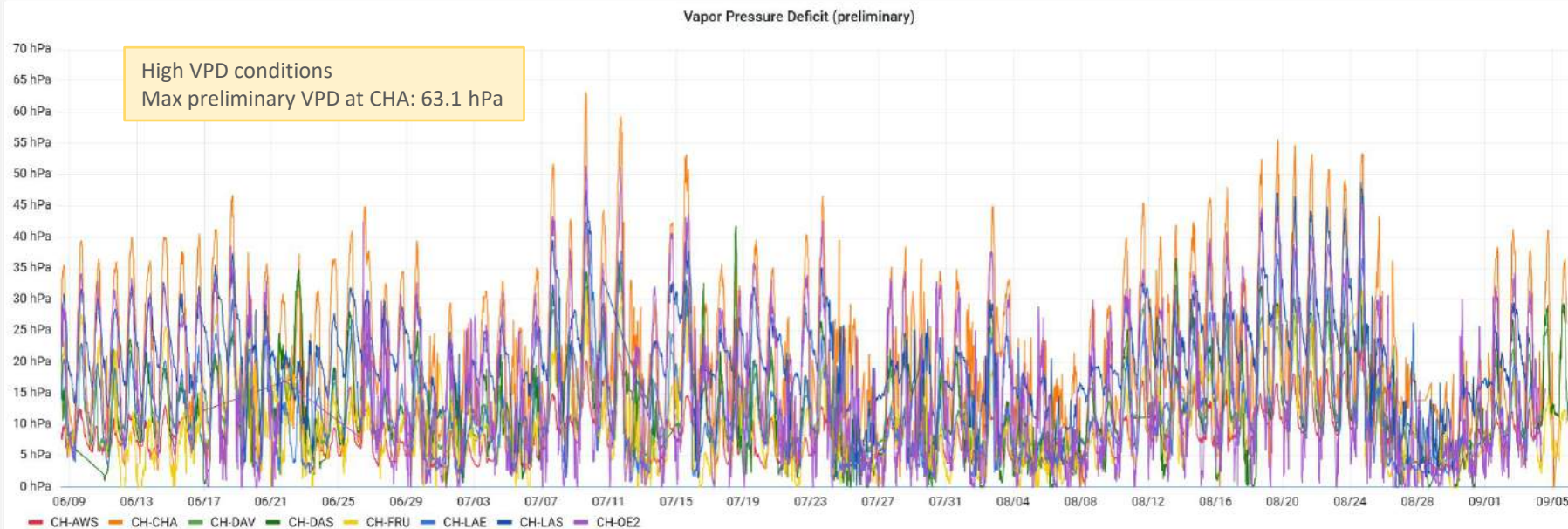


Max TA observed at OE2: 36.9°C (1MIN)

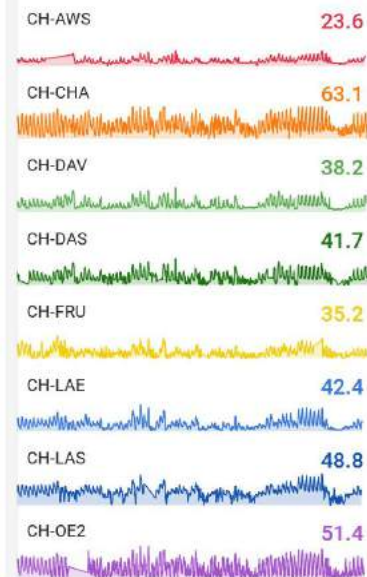


VPD

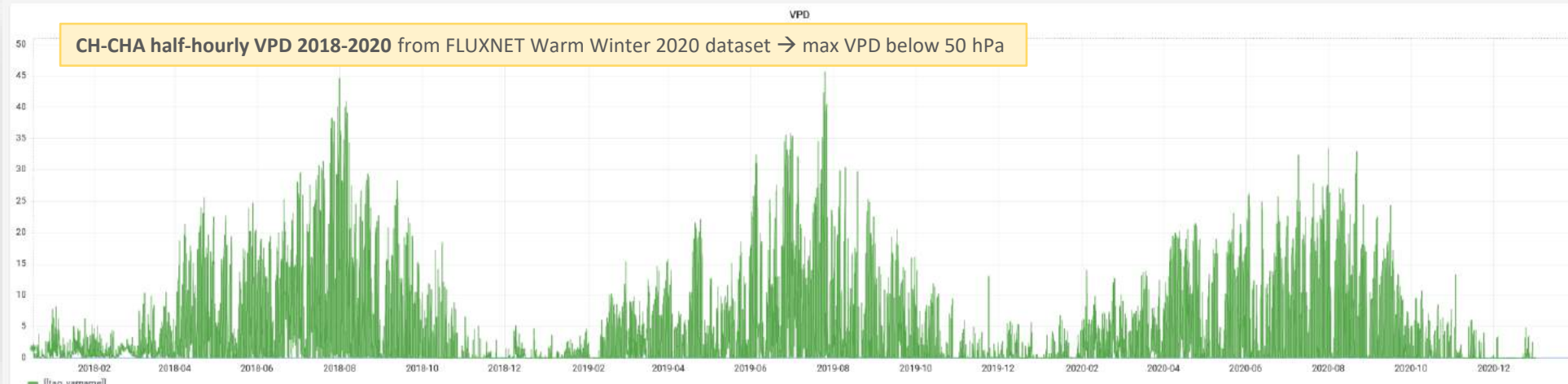
- processed data
- Level-0 (preliminary)
- from flux calcs
- no quality checks
- 30MIN resolution



Max

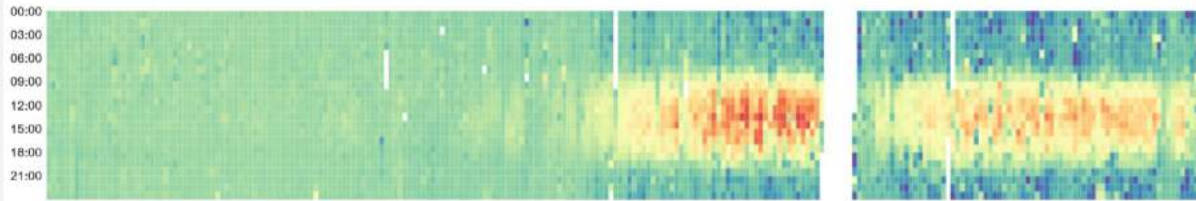


CH-CHA half-hourly VPD 2018-2020 from FLUXNET Warm Winter 2020 dataset → max VPD below 50 hPa

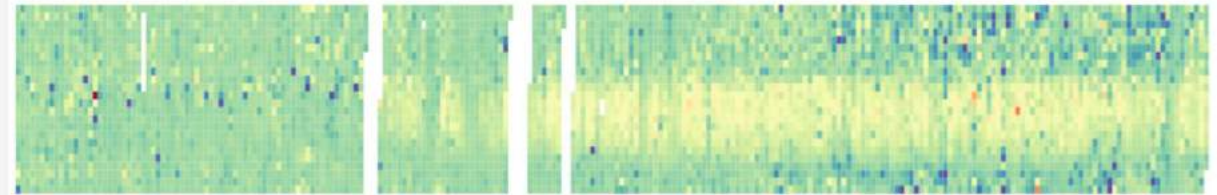


CO₂ flux: This year so far ...

CH-AWS (hourly)

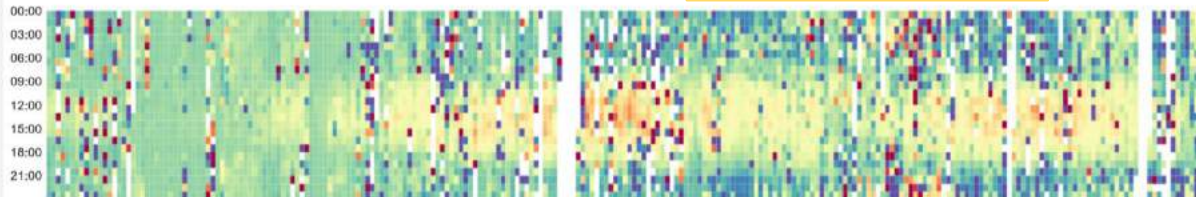


CH-DAV (hourly)

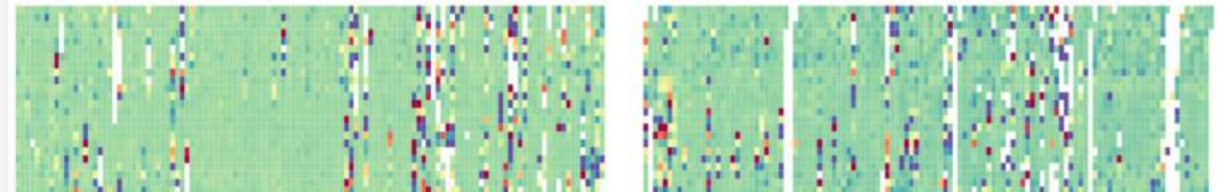


CH-FRU (hourly)

Sonic issues with wind component w

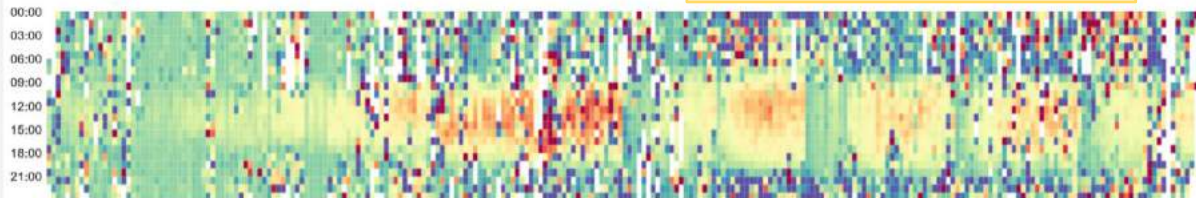


CH-DAS (hourly)

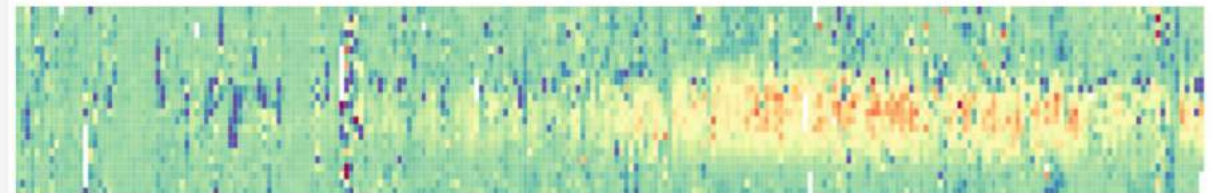


CH-CHA (hourly)

Recurring sonic issues with wind component w

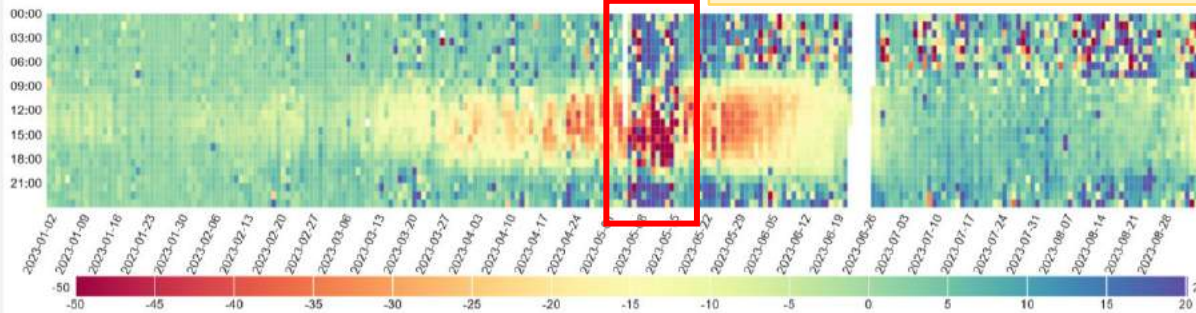


CH-LAE (hourly)

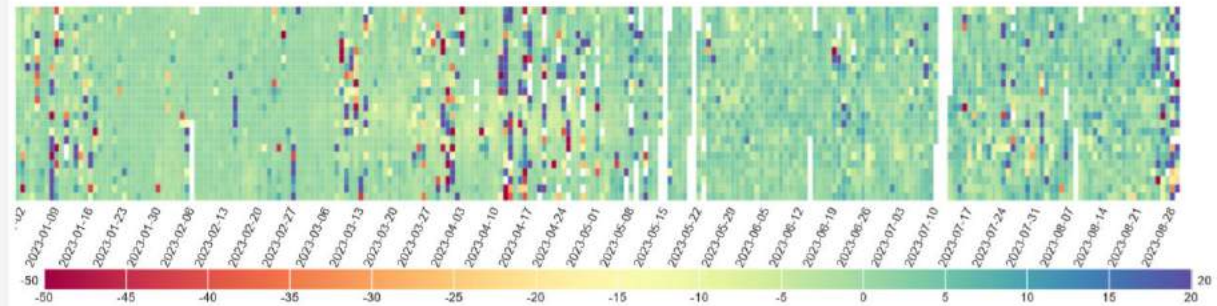


CH-OE2 (hourly)

Offset in wind component w caused amplified fluxes

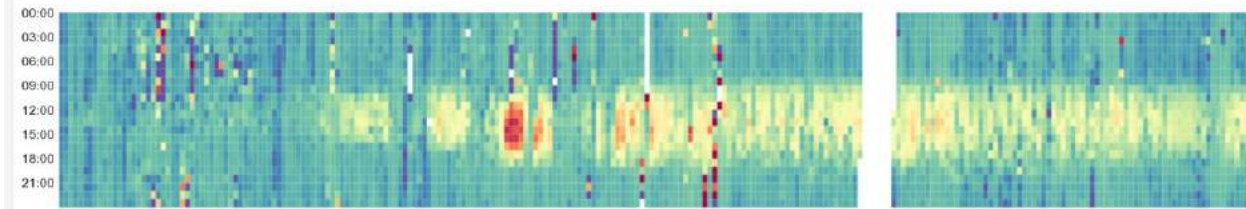


CH-LAS (hourly)

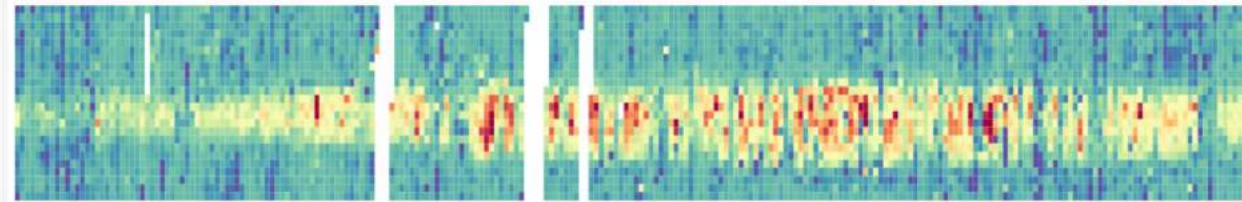


ALL SITES Sensible Heat Fluxes (H)

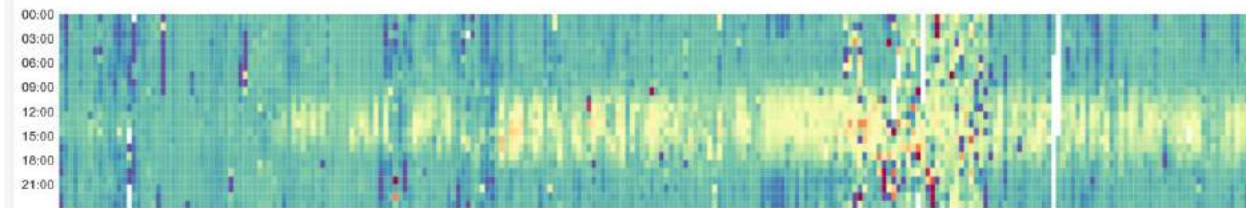
CH-AWS (hourly)



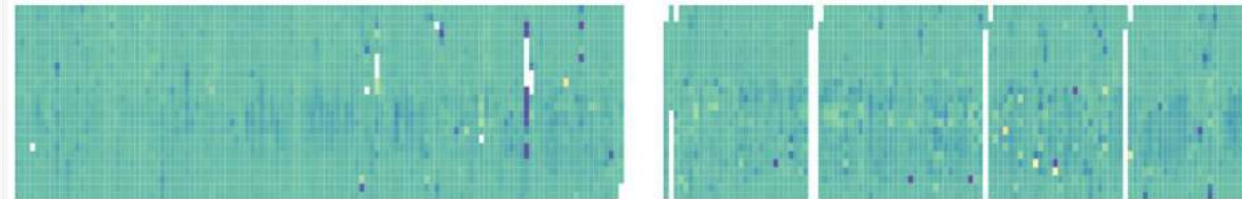
CH-DAV (hourly)



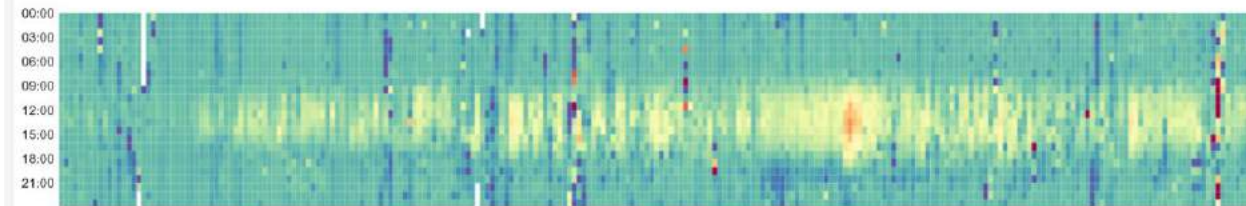
CH-FRU (hourly)



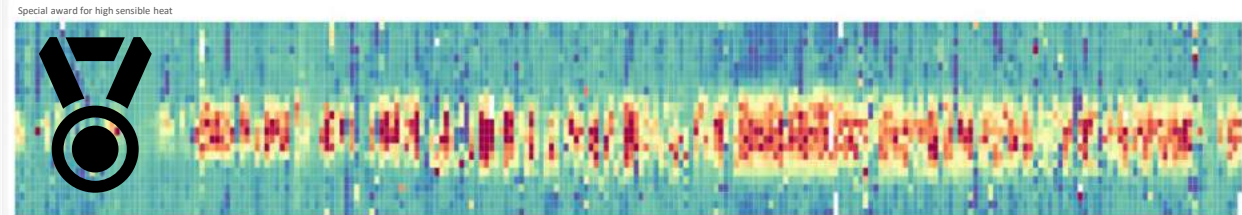
CH-DAS (hourly)



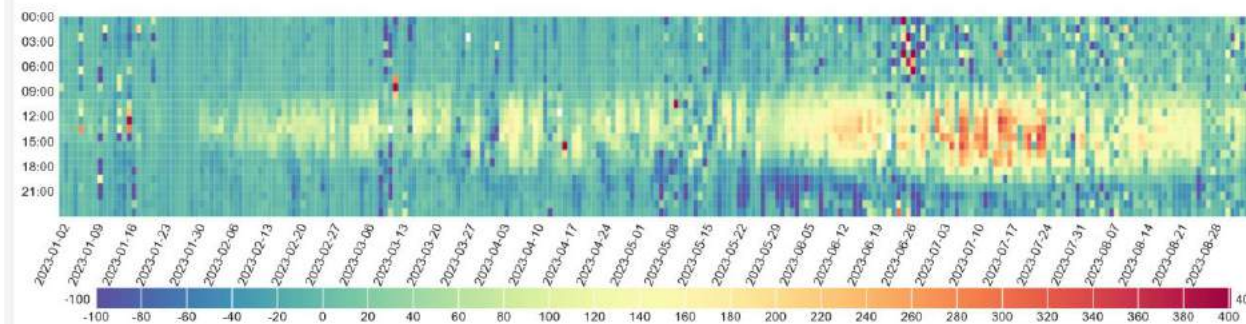
CH-CHA (hourly)



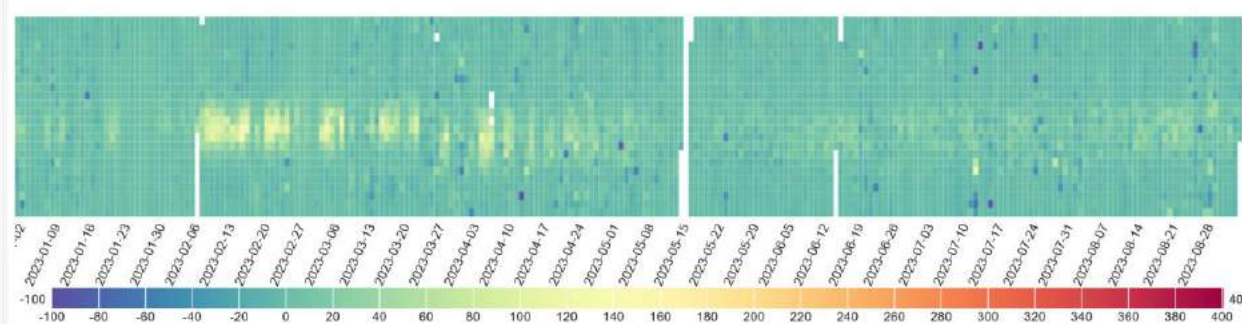
CH-LAE (hourly)



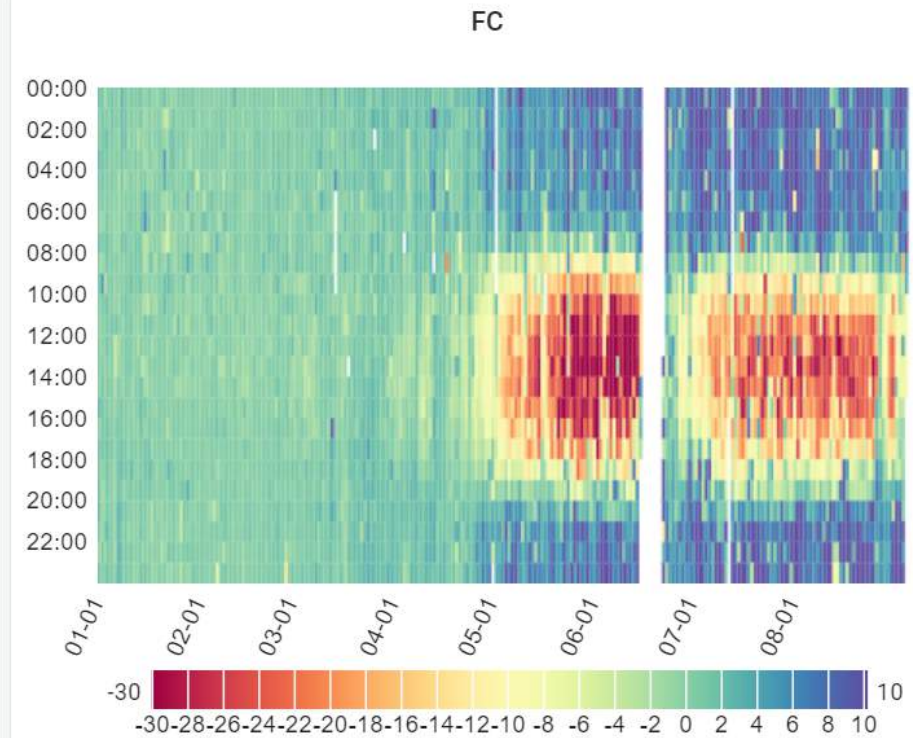
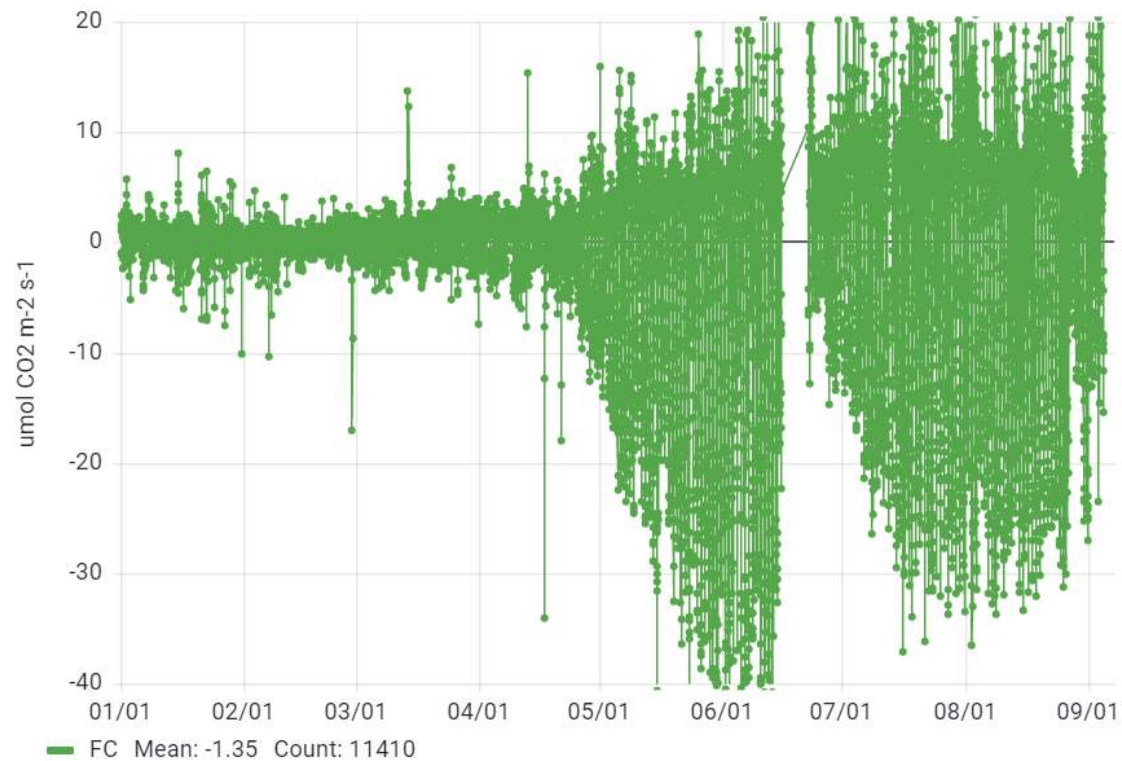
CH-OE2 (hourly)

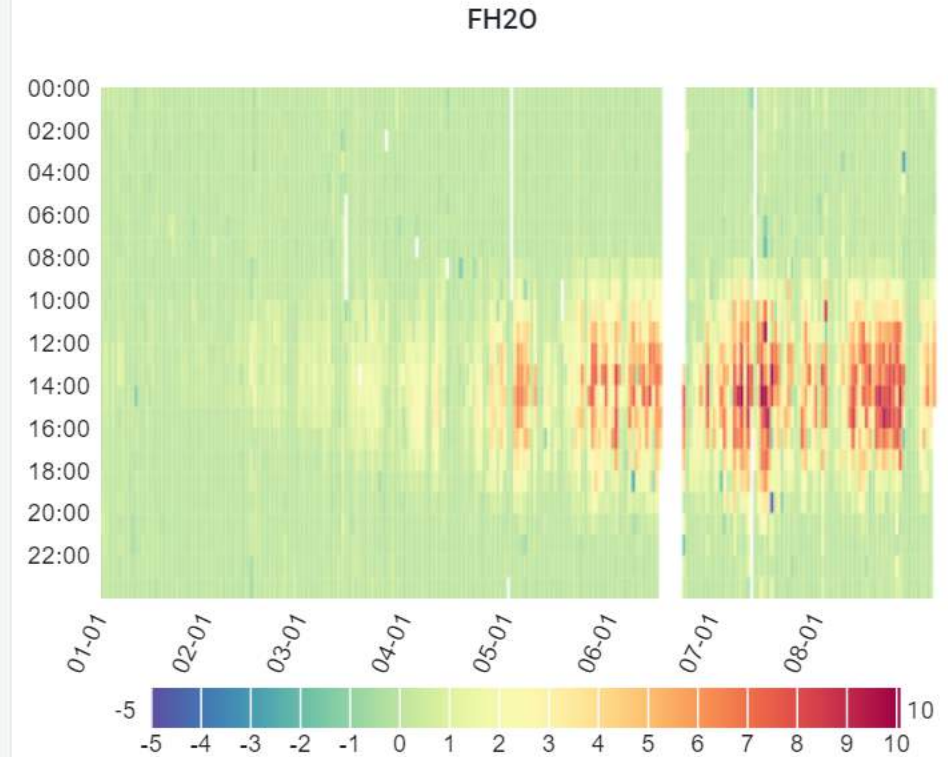
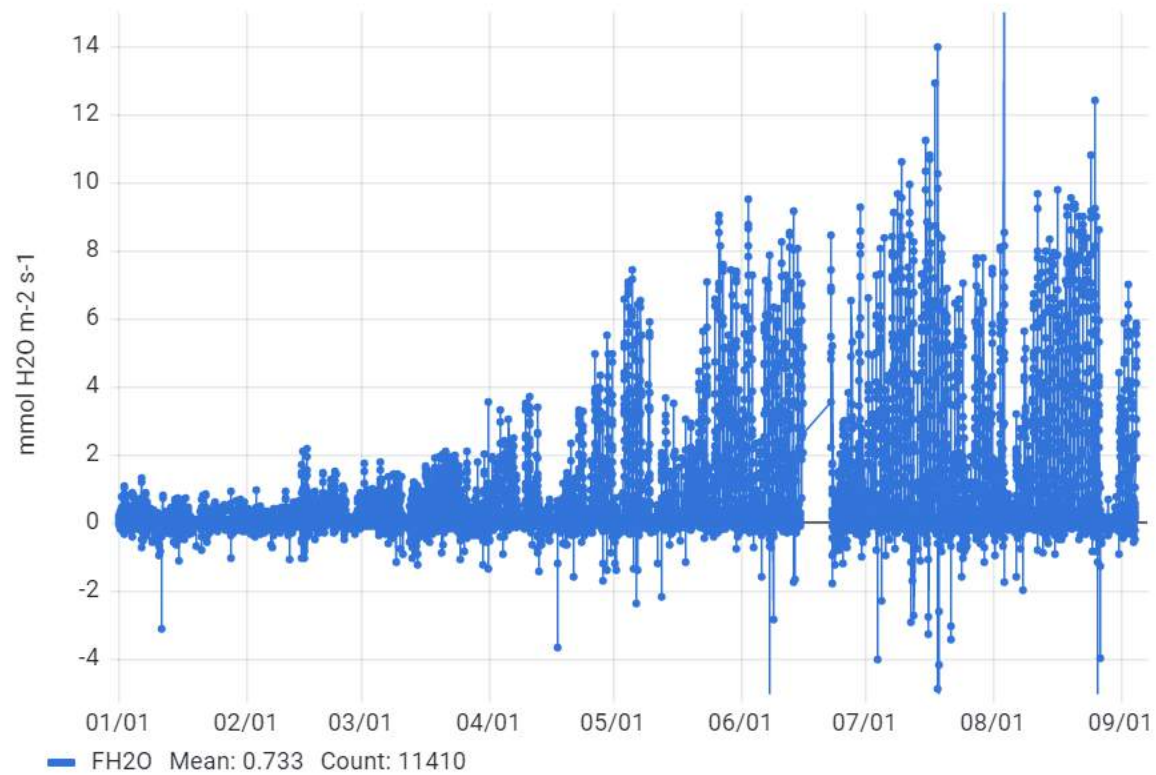


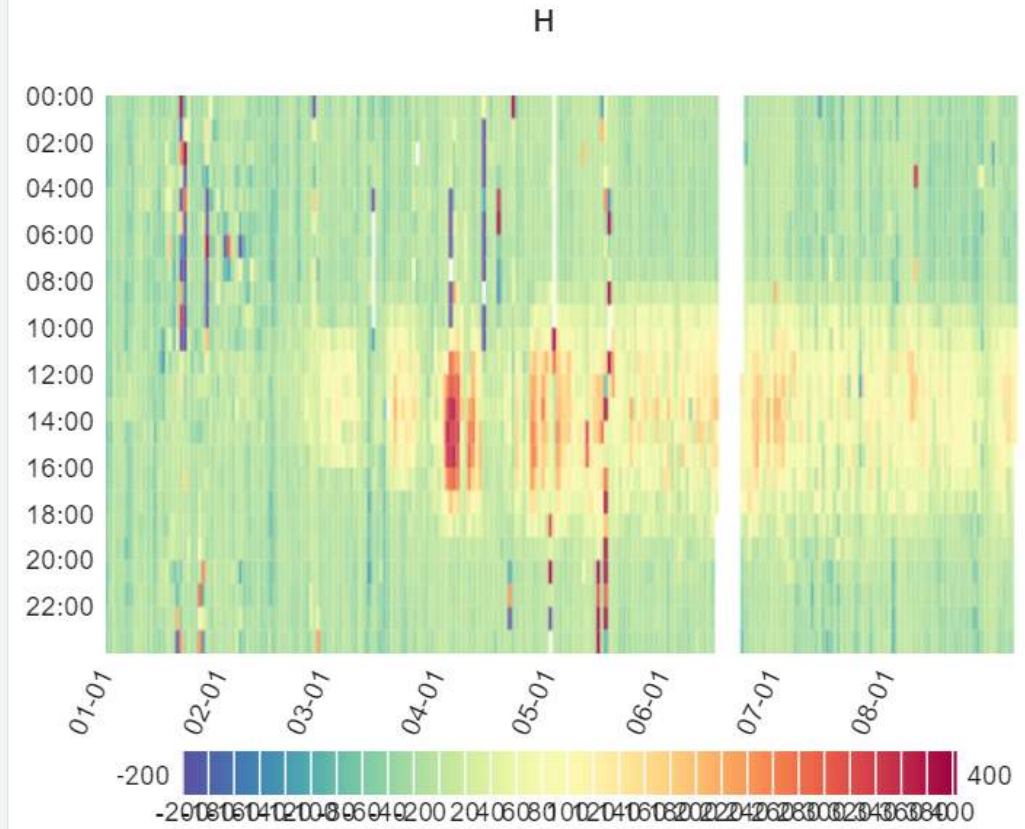
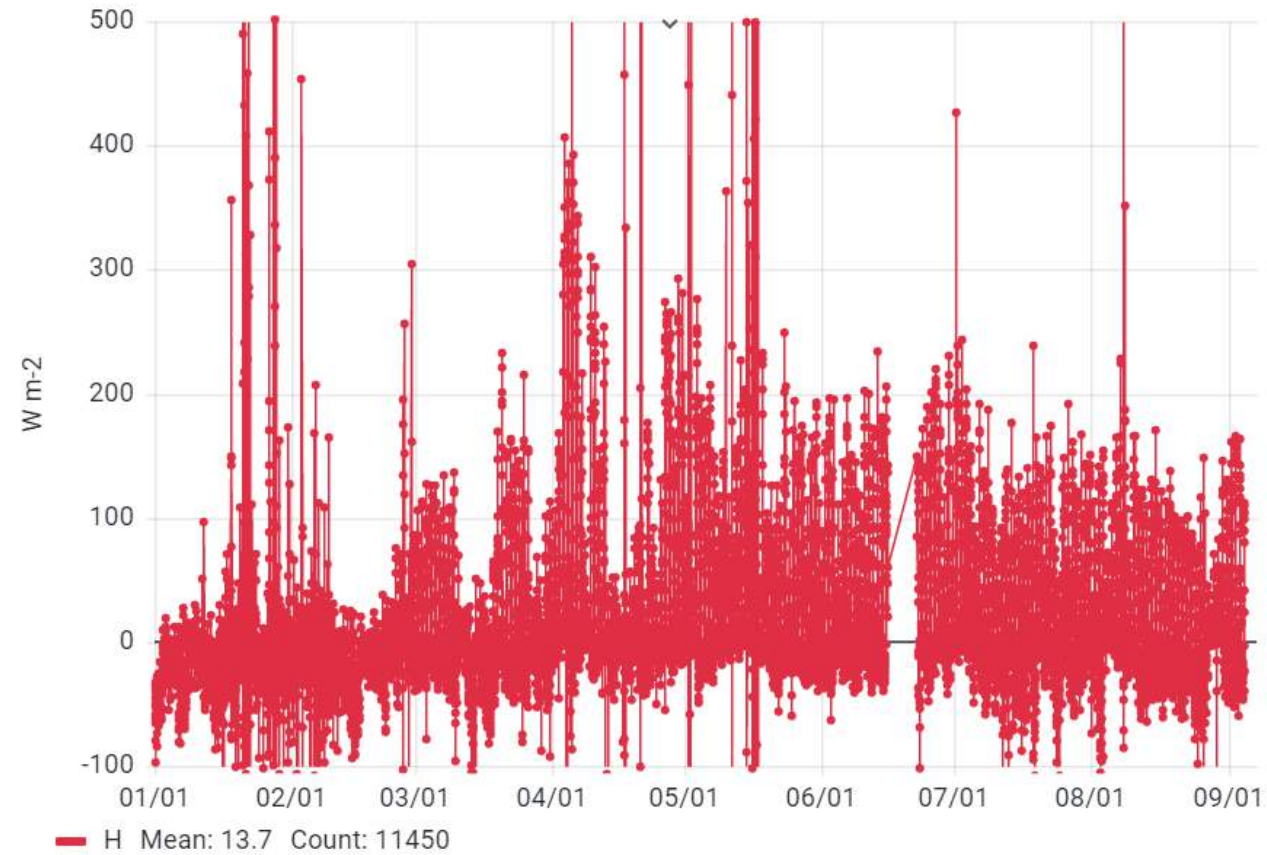
CH-LAS (hourly)

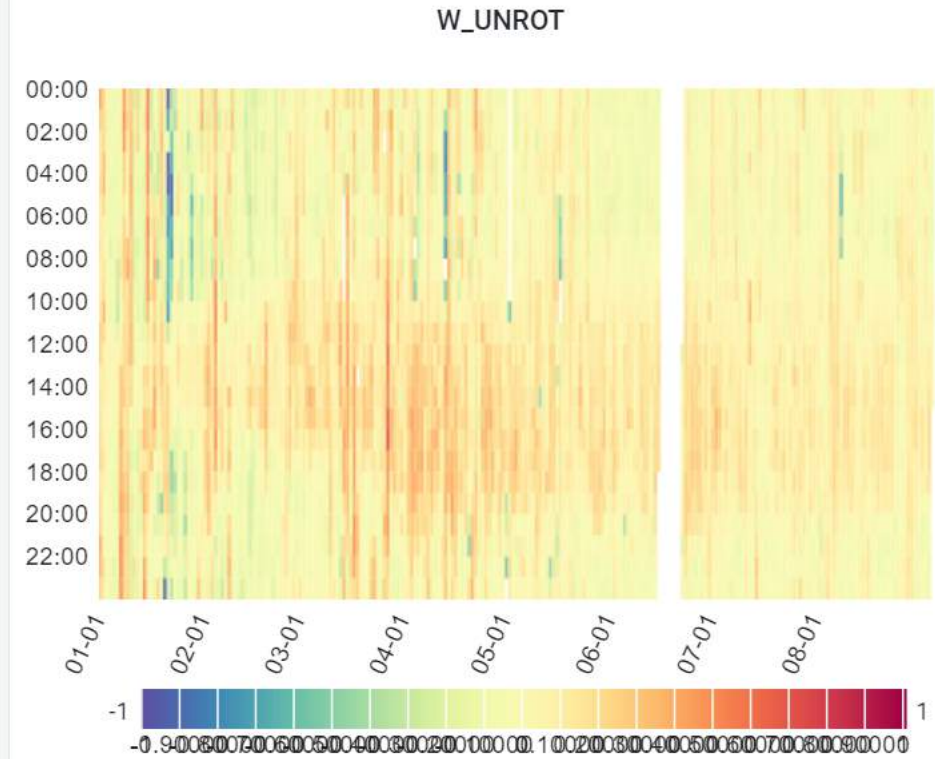
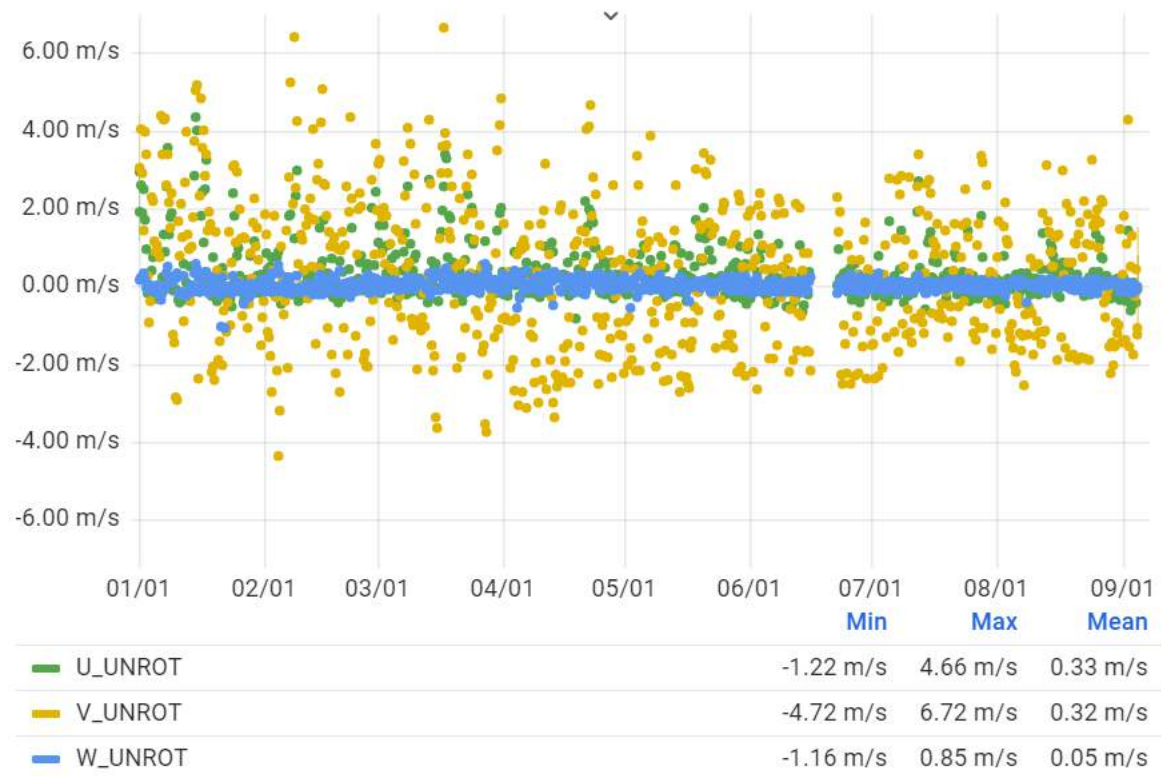








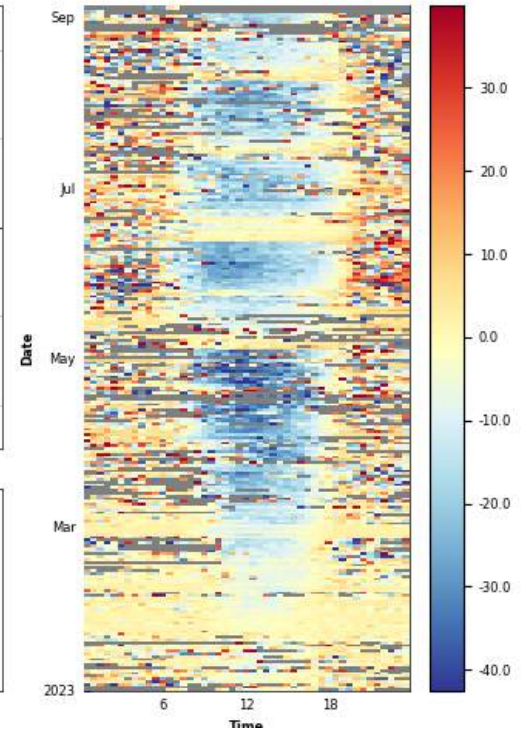
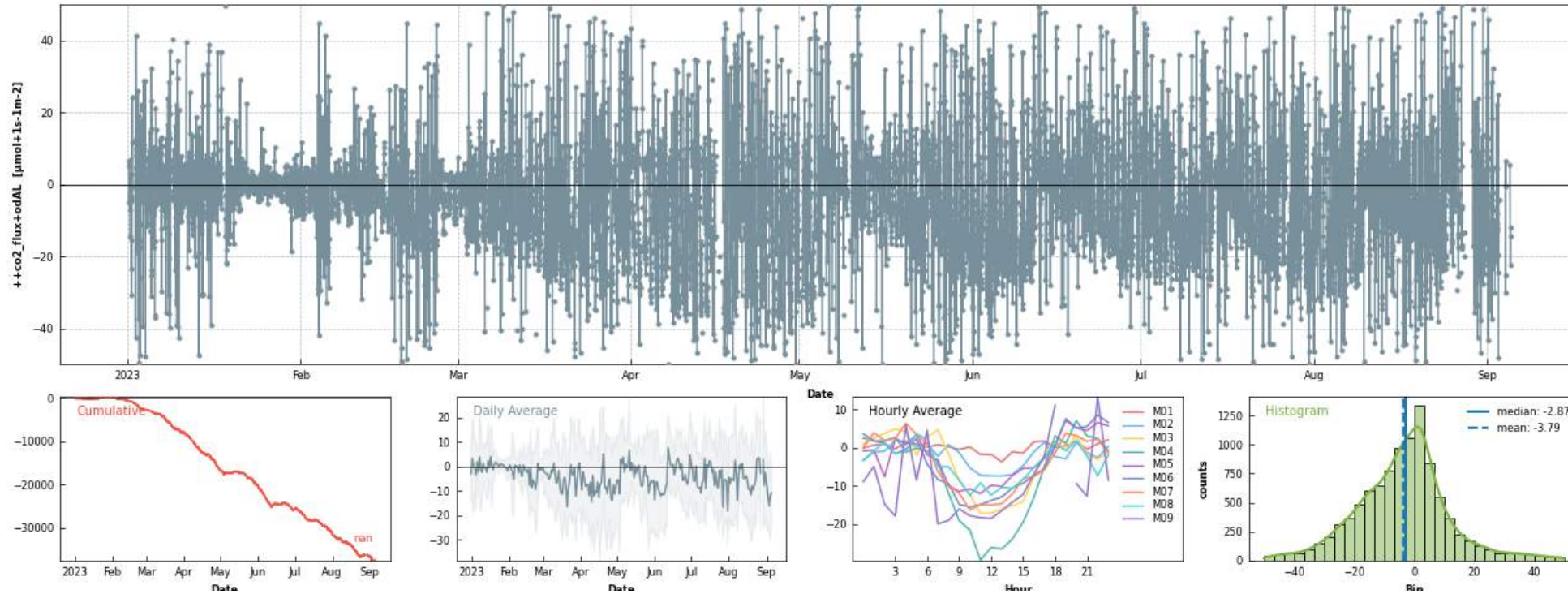


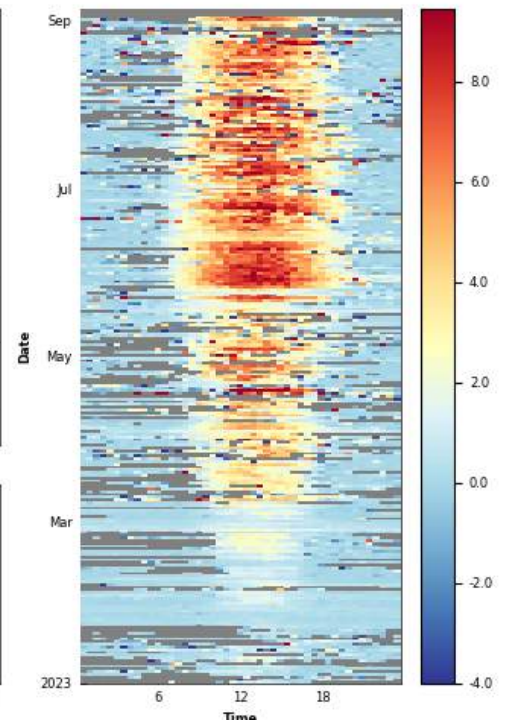
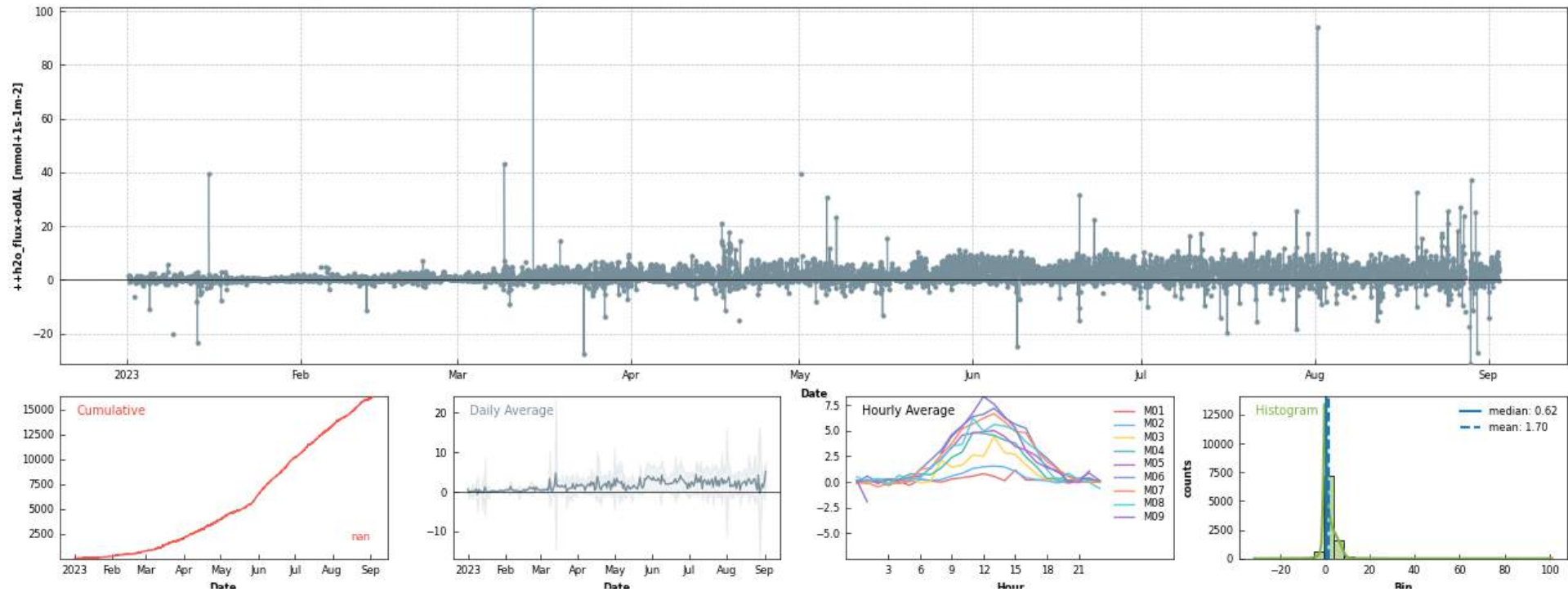




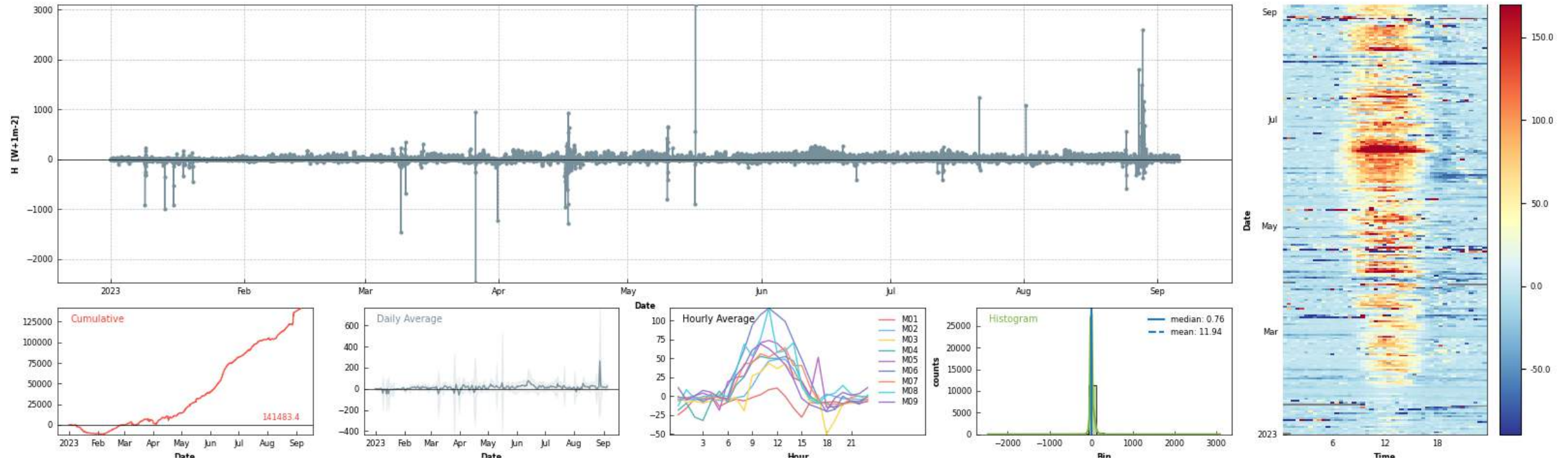


- 1st mowing: 2023.05.04
- 2nd mowing: 2023.06.11
- 3rd mowing: 2023.07.13
- 4th mowing: 2023.08.08

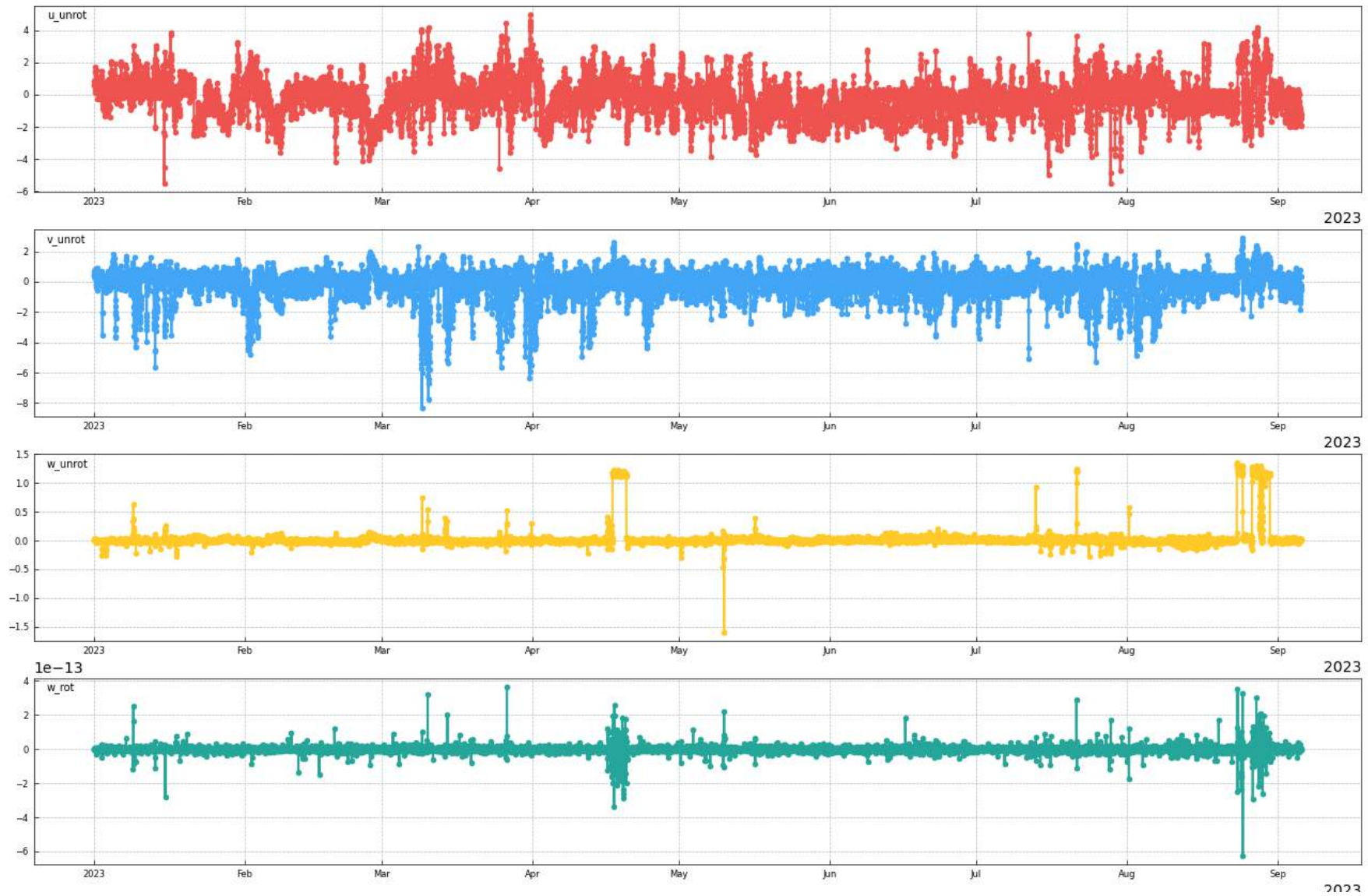




- Recent w_unrot offset: highly fluctuating H fluxes



- w_unrot offset was back: **fixed by sonic restart**



High resolution (20Hz) eddy covariance raw data plot, covering 6 hours (432 000 records)

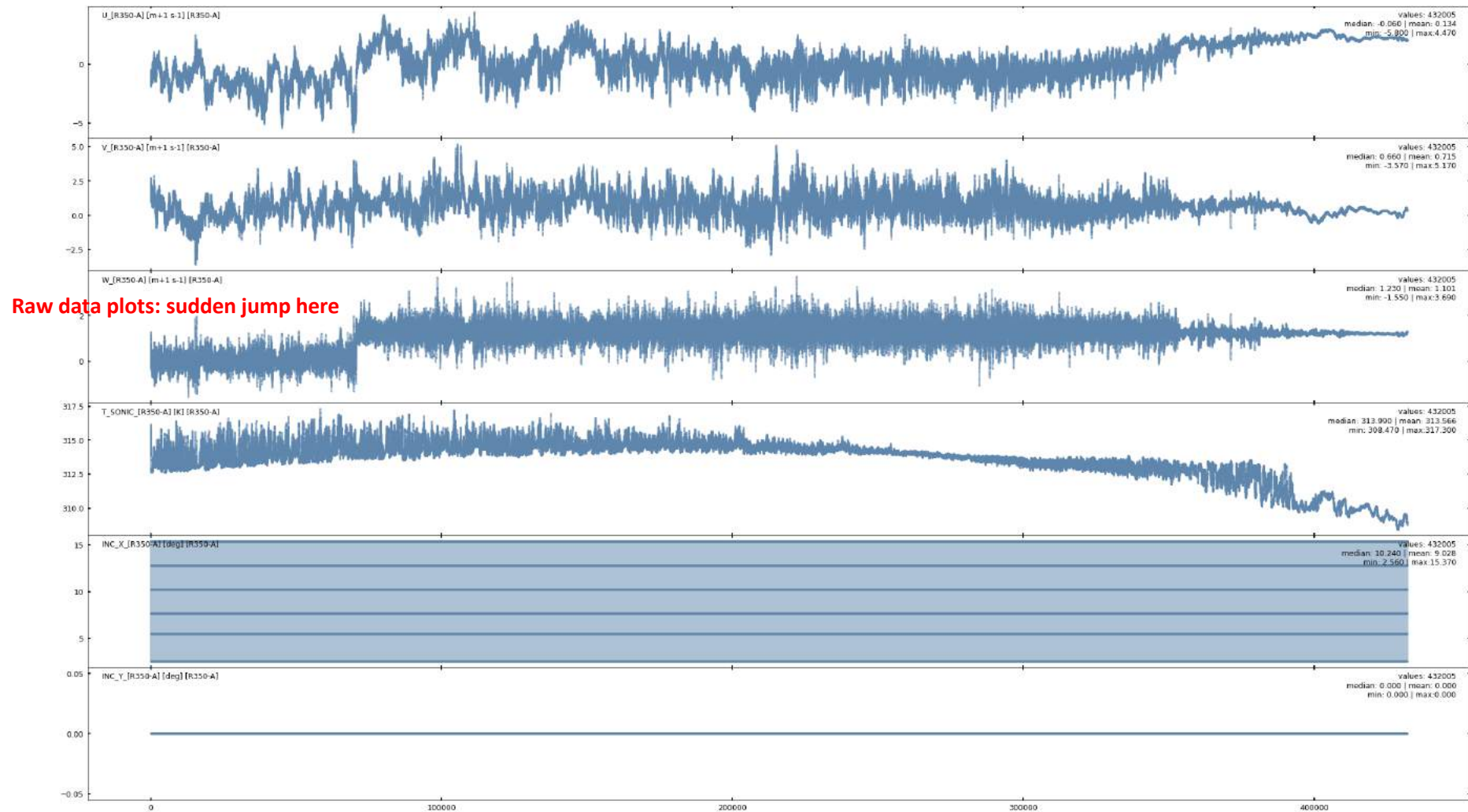
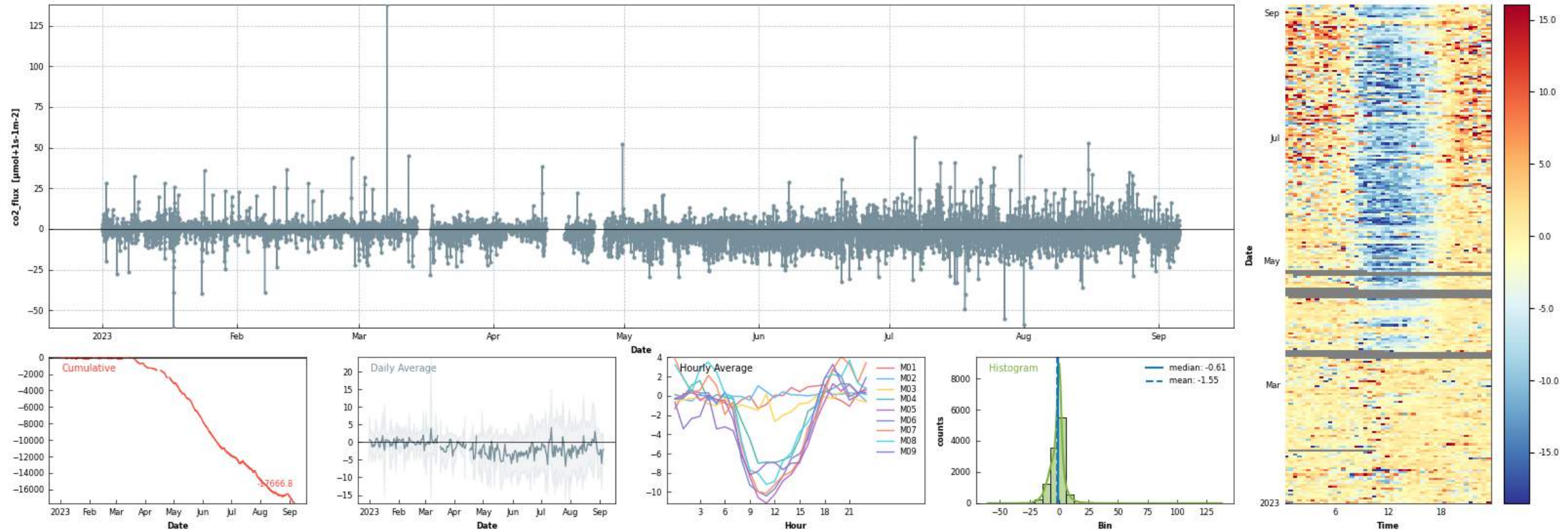


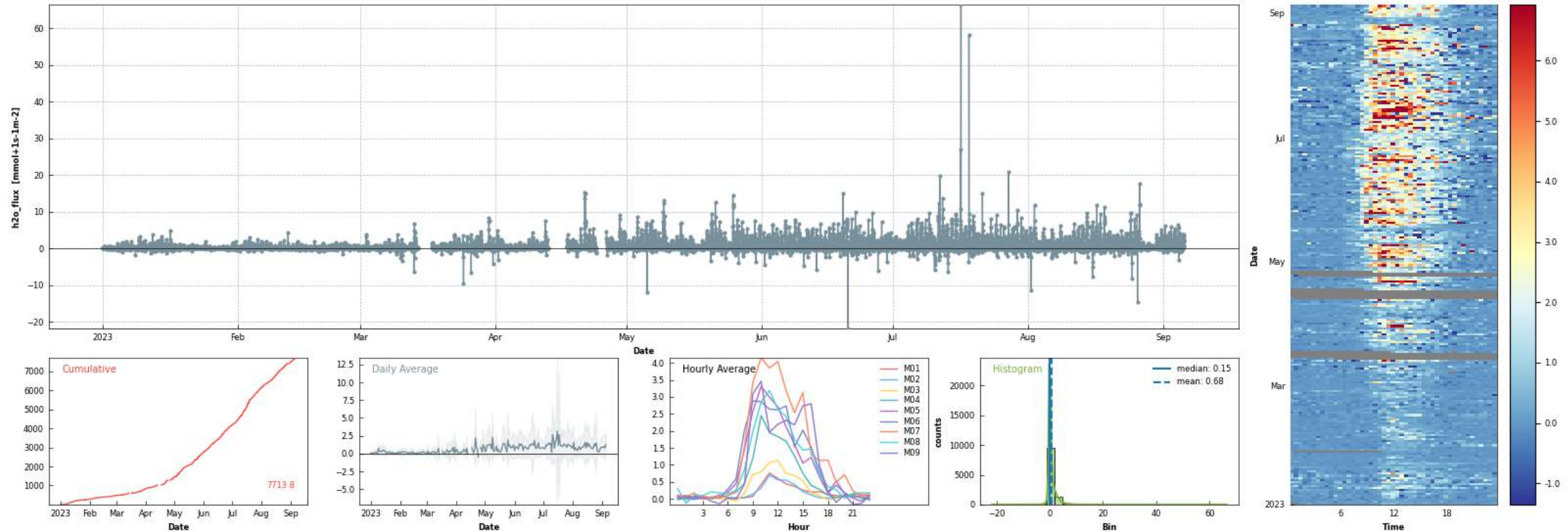


Photo: Lukas Hörtnagl

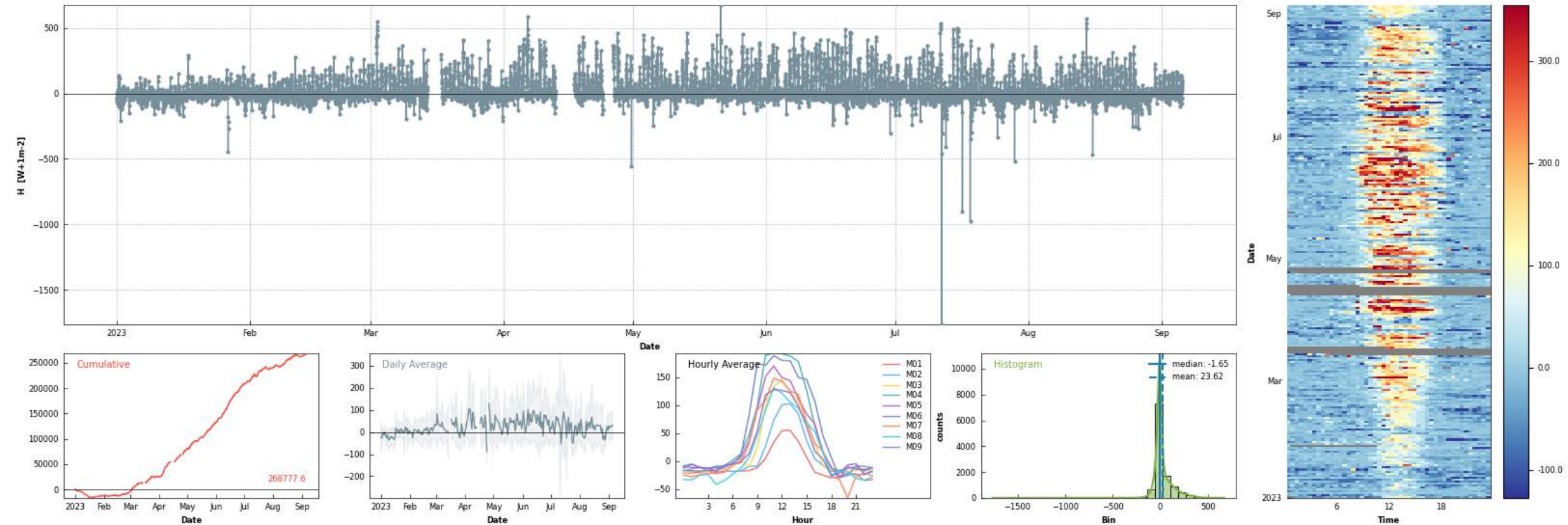
- CO₂ fluxes quite complete since the change of the sonic beginning of May
- Rainy and cold weather period led to a reduction in net CO₂ uptake end of August

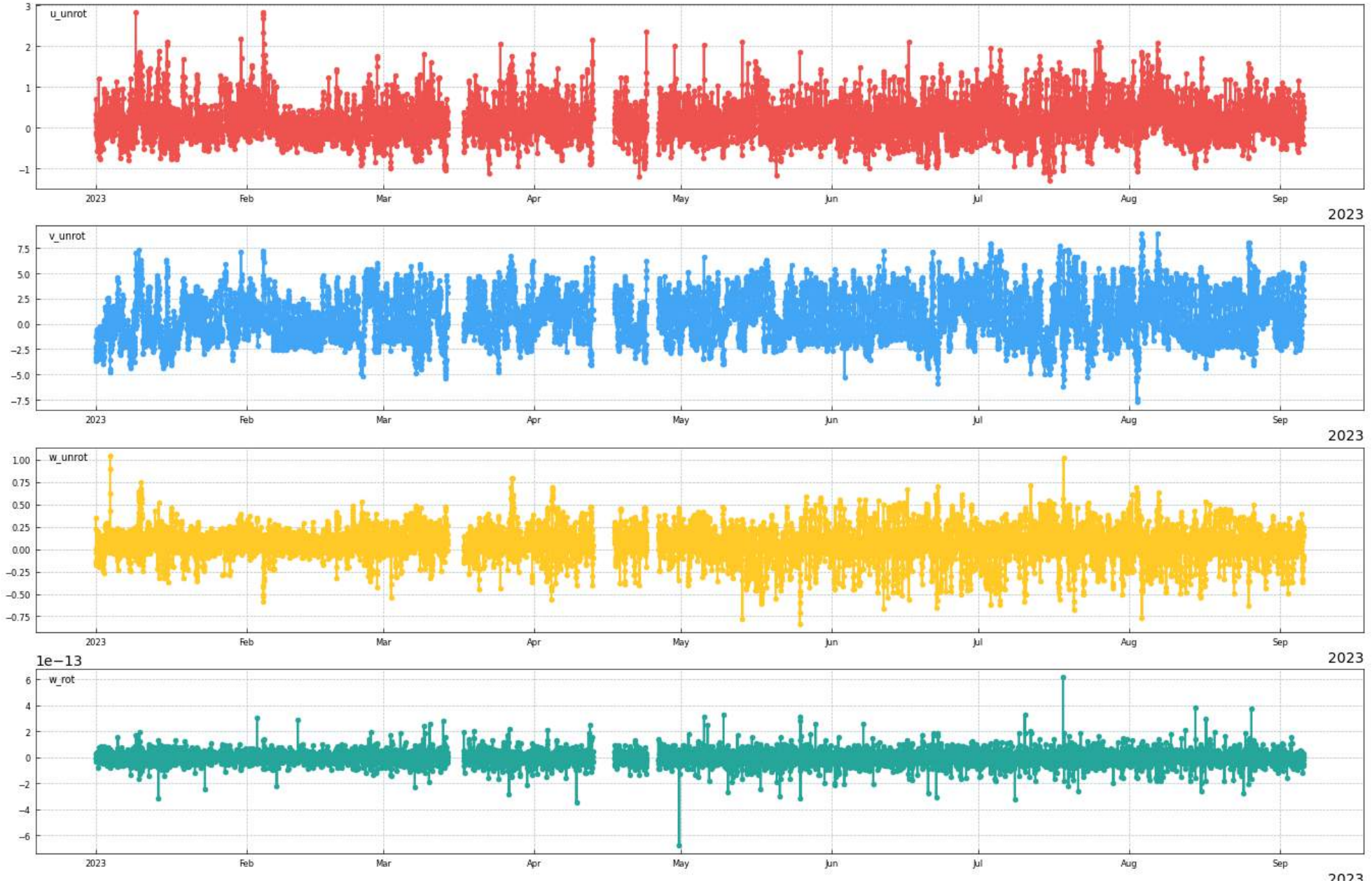


- Looks good, also here small fluxes end of August



- Similar to other fluxes, also here small fluxes end of August





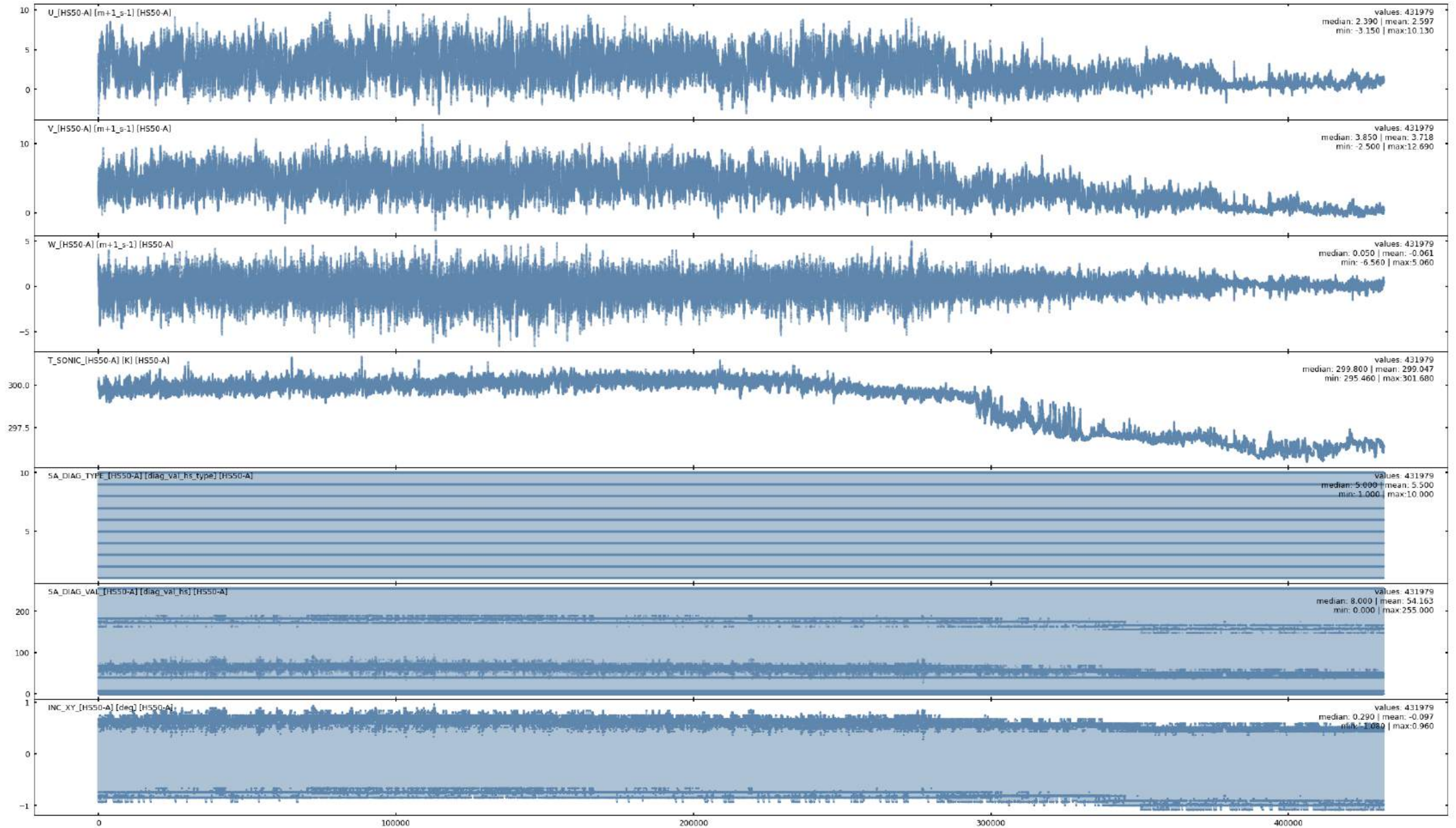
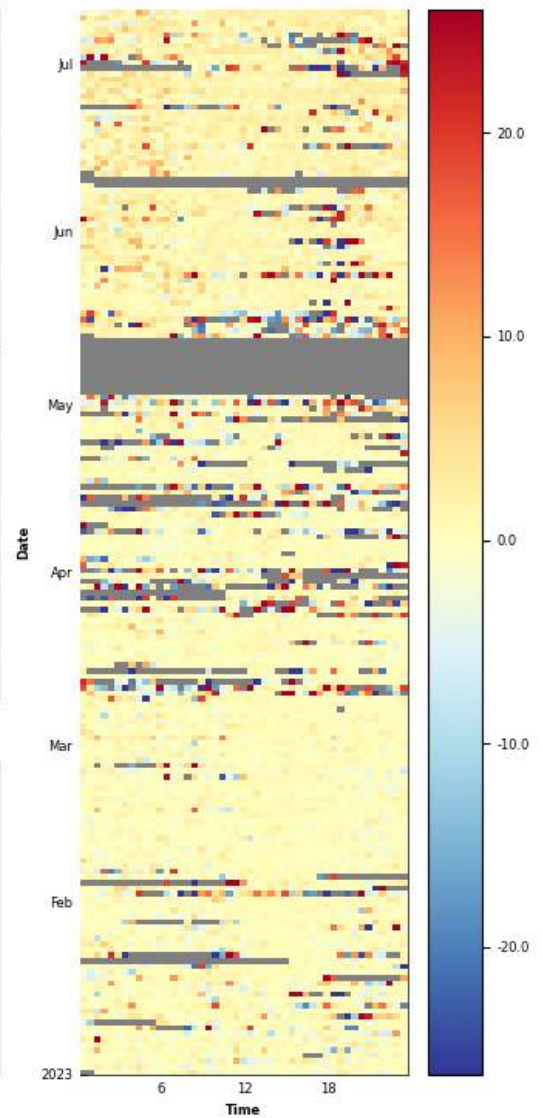
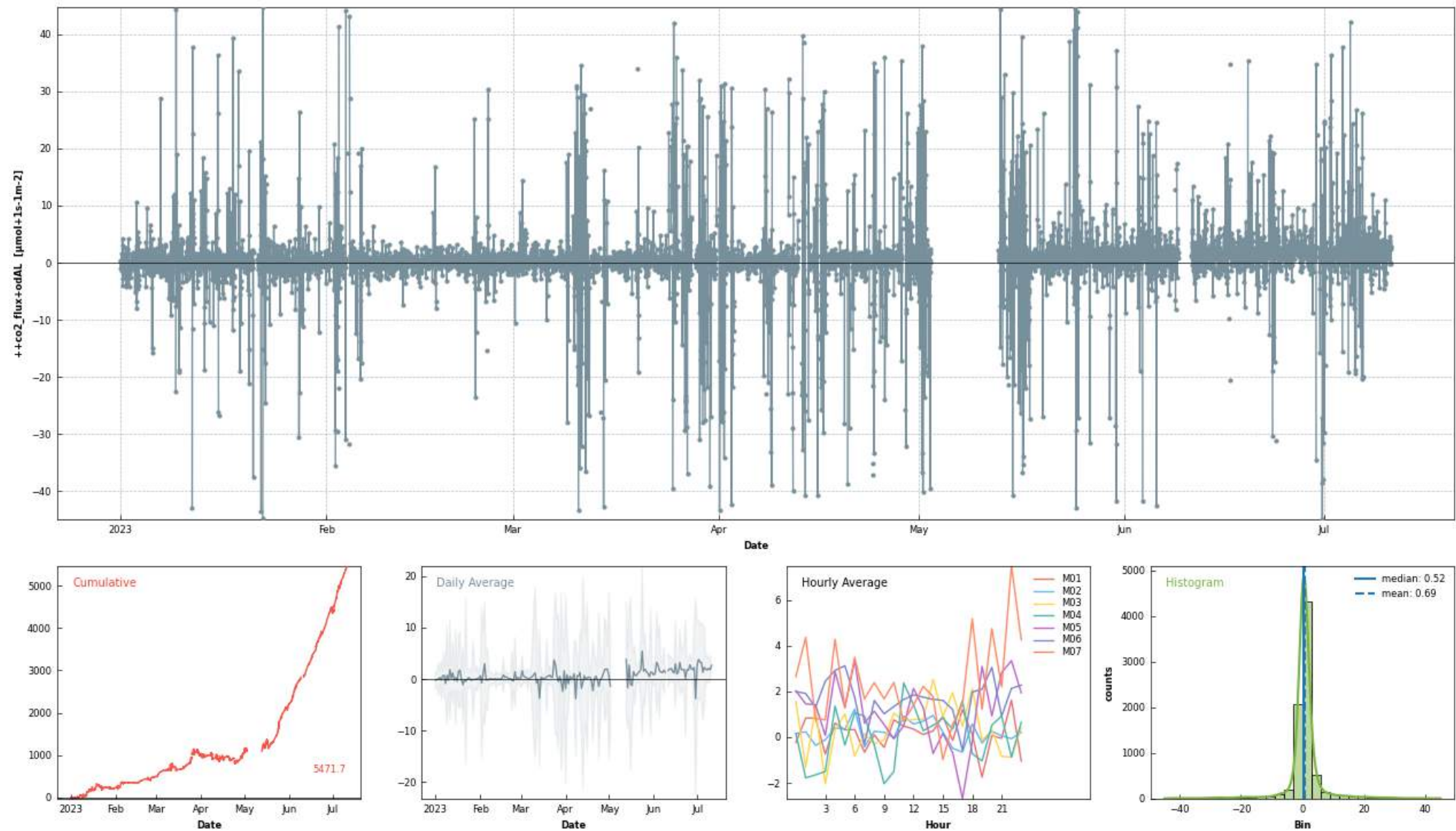
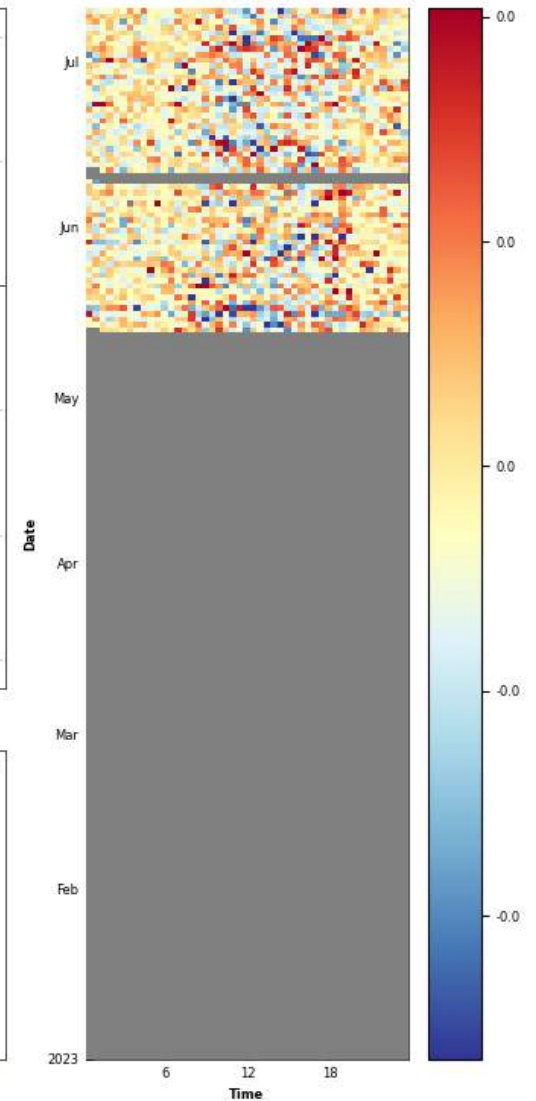
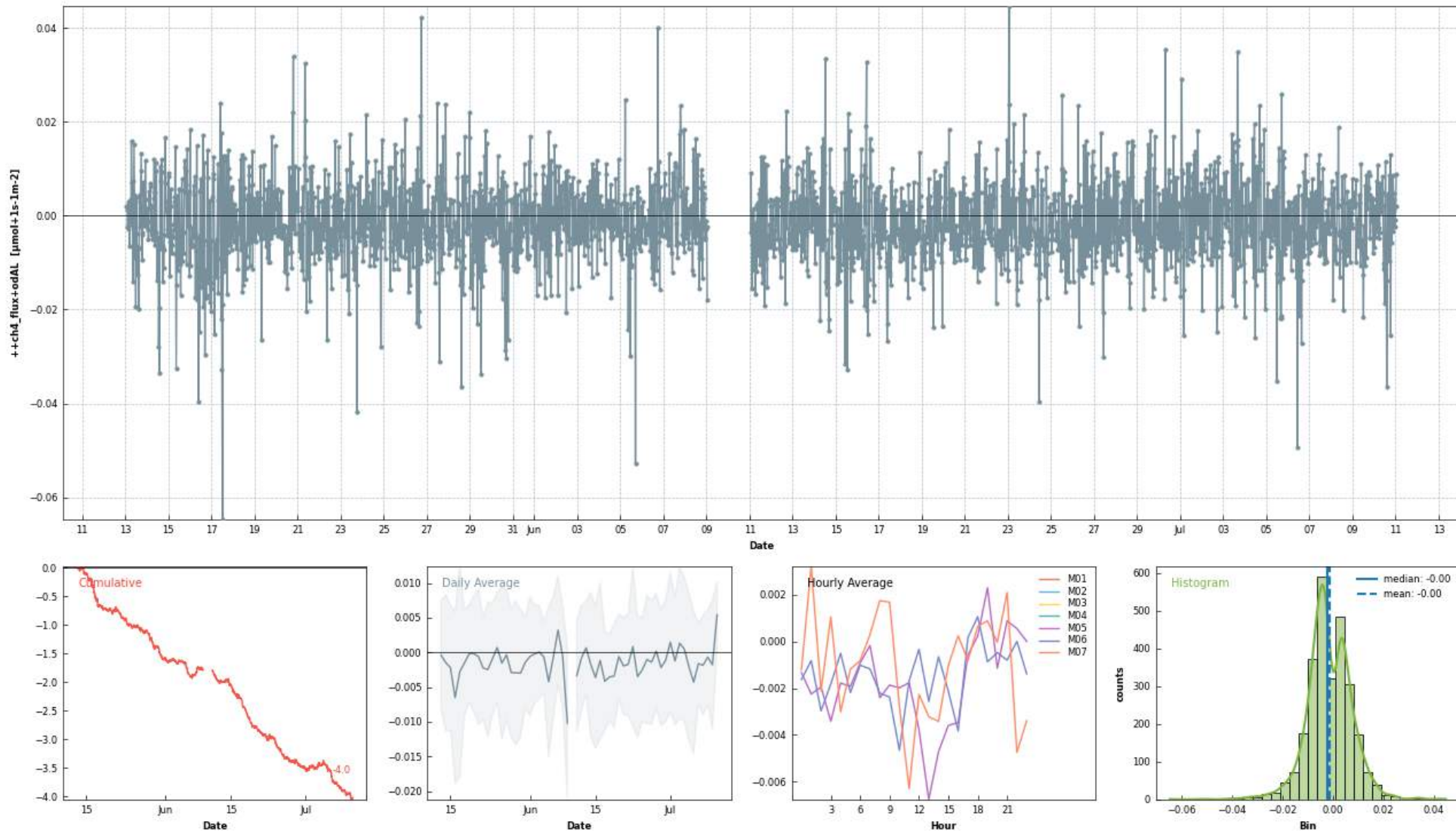
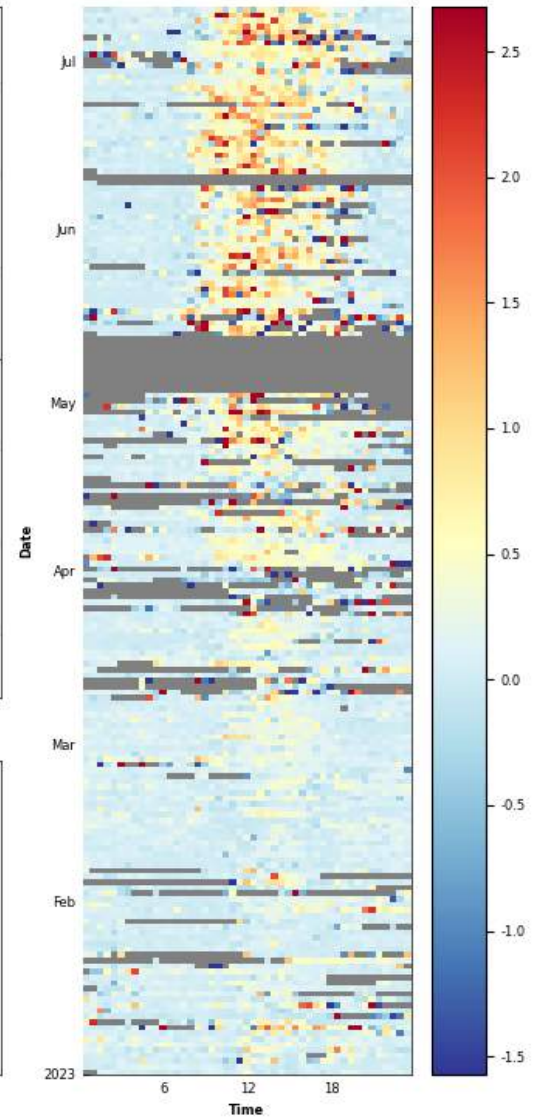
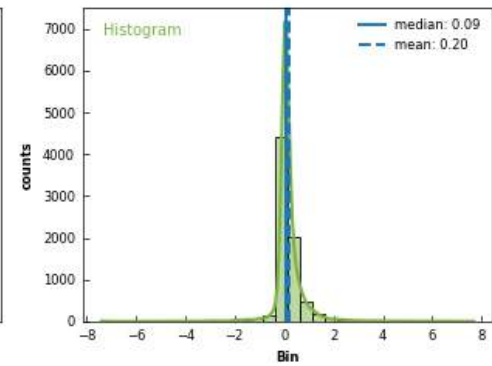
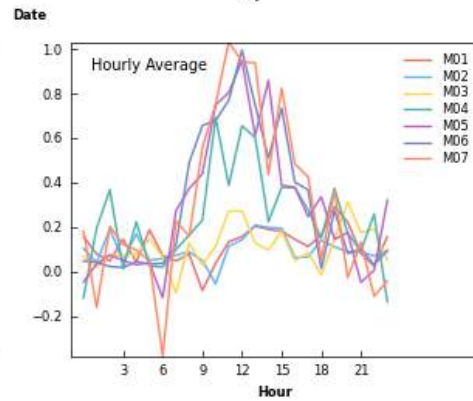
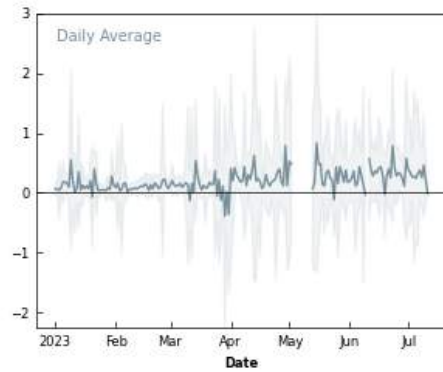
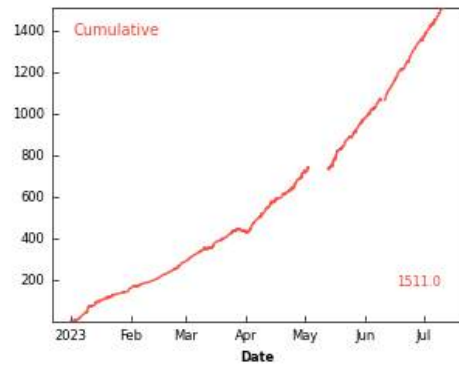
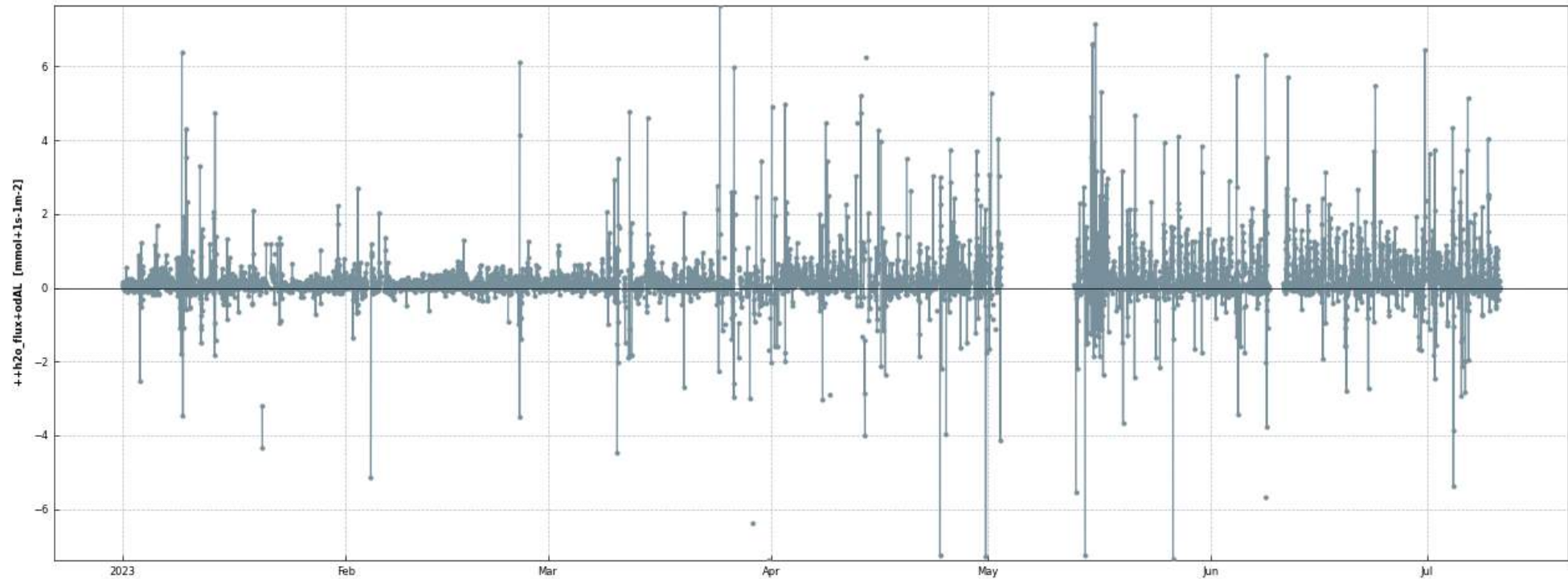


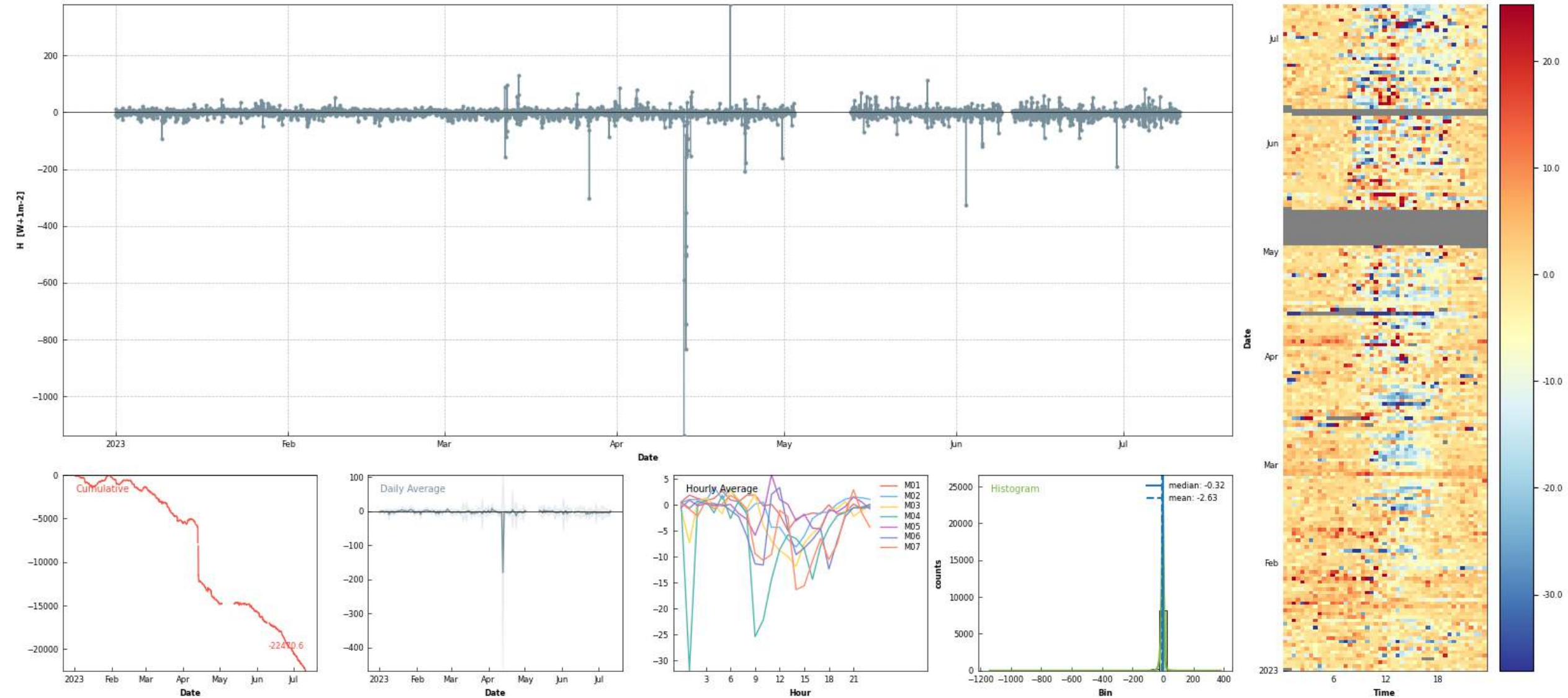


Photo: Luana Krebs









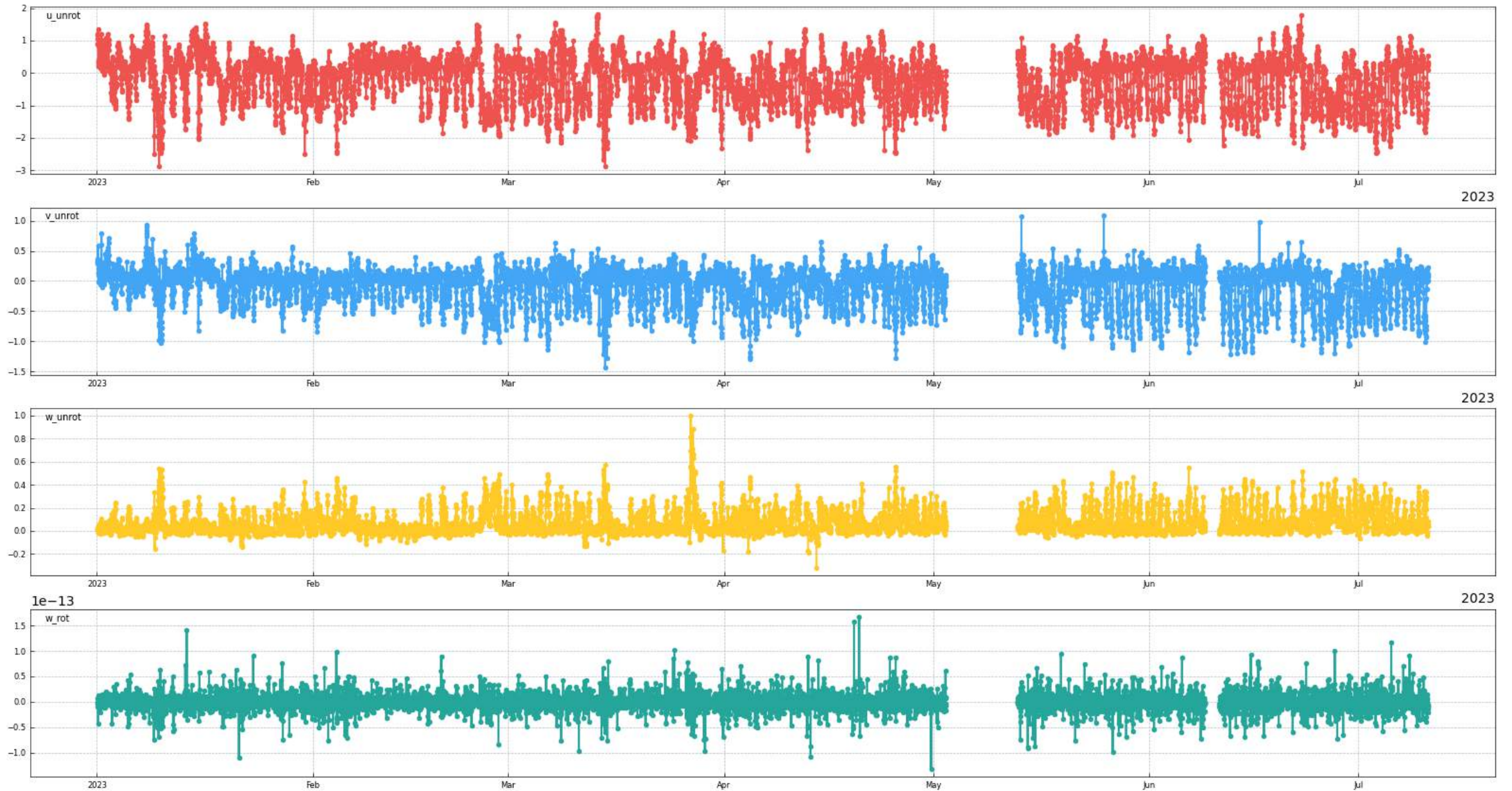
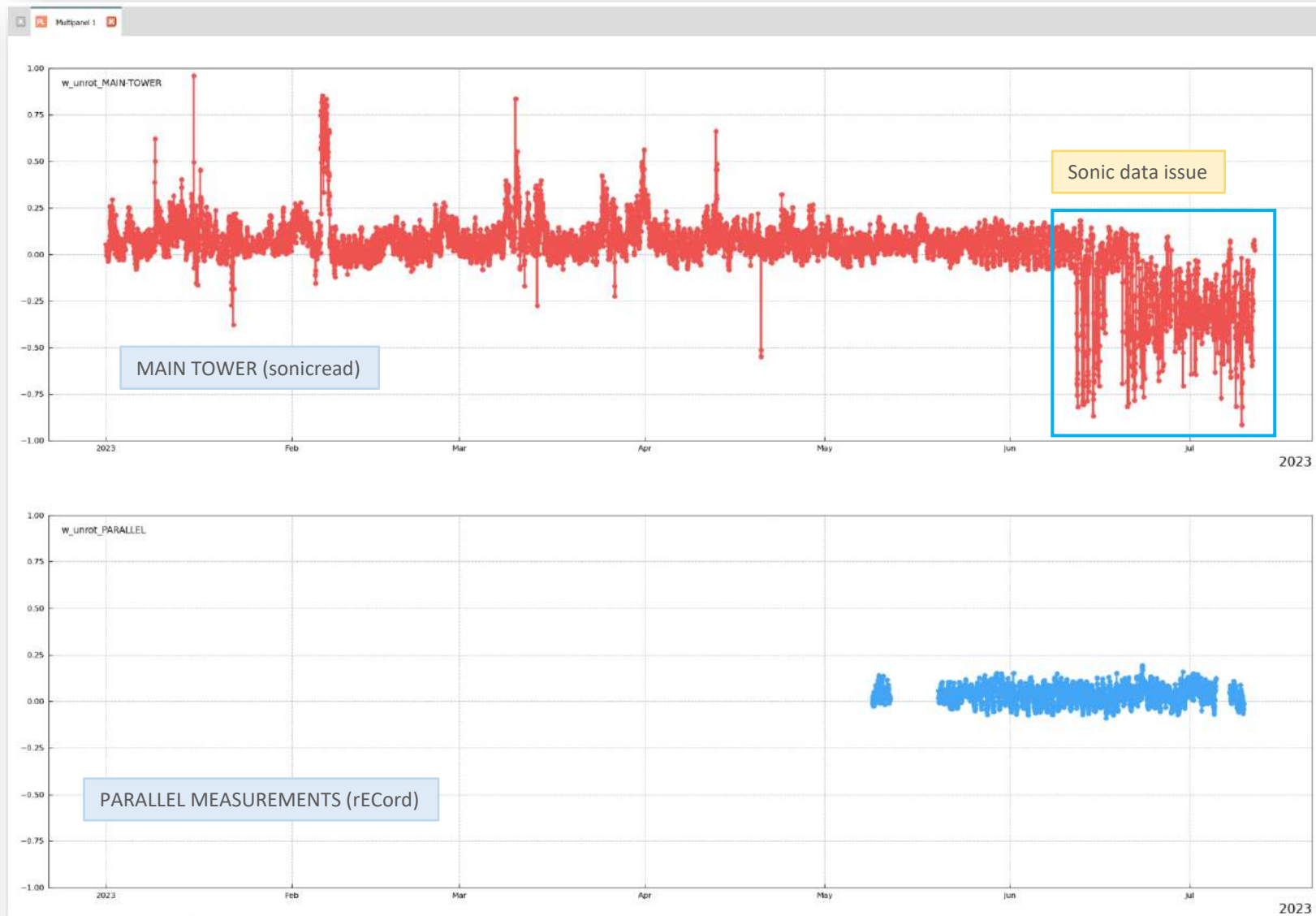




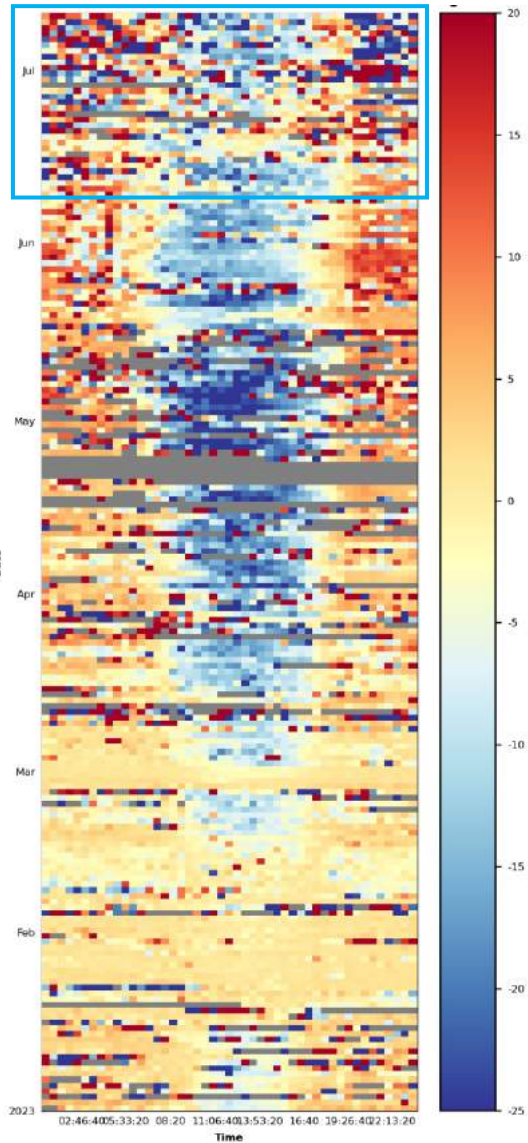
Photo: Lukas Hörtnagl



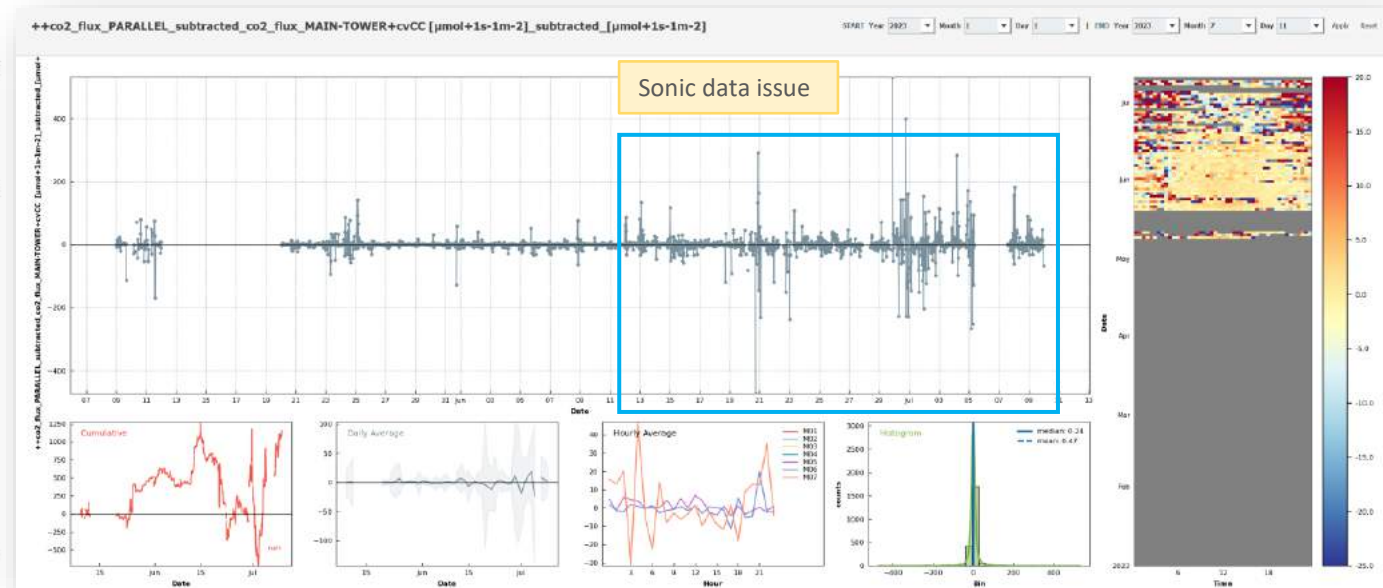
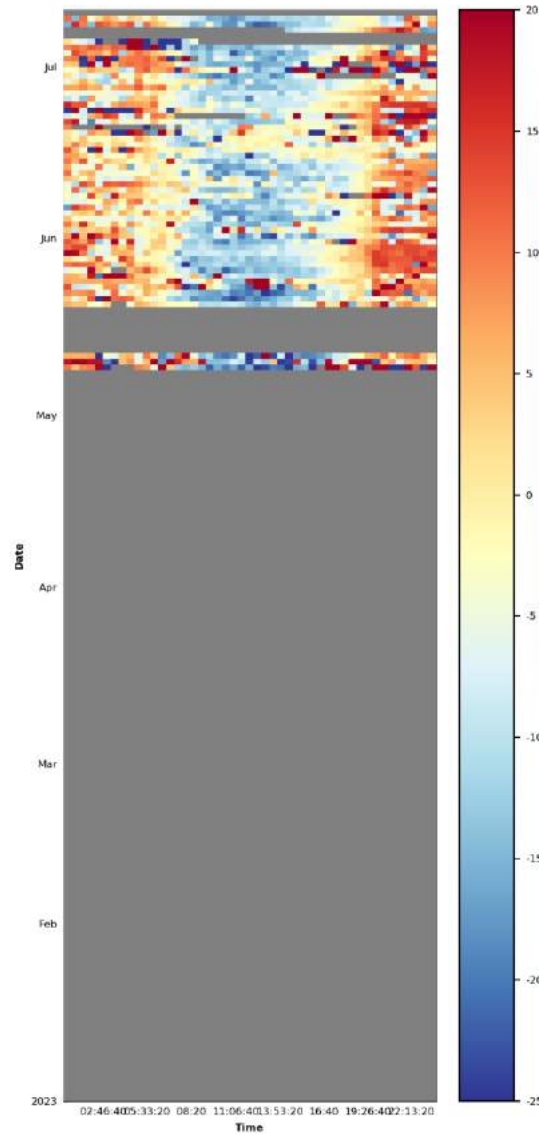
- Issues with sonic data started on 12 Jun 2023
- But sonic data from parallel measurements look good



MAIN TOWER (sonicread)

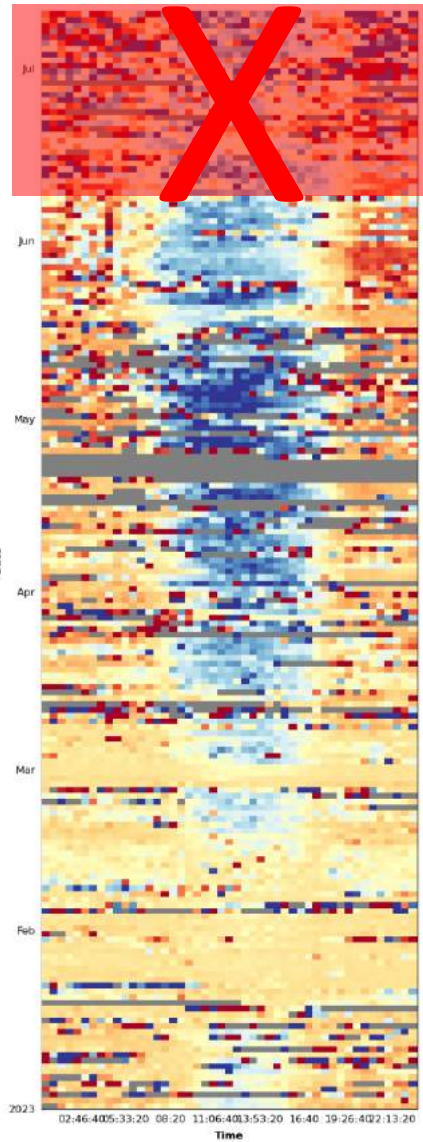


PARALLEL MEASUREMENTS (rECord)

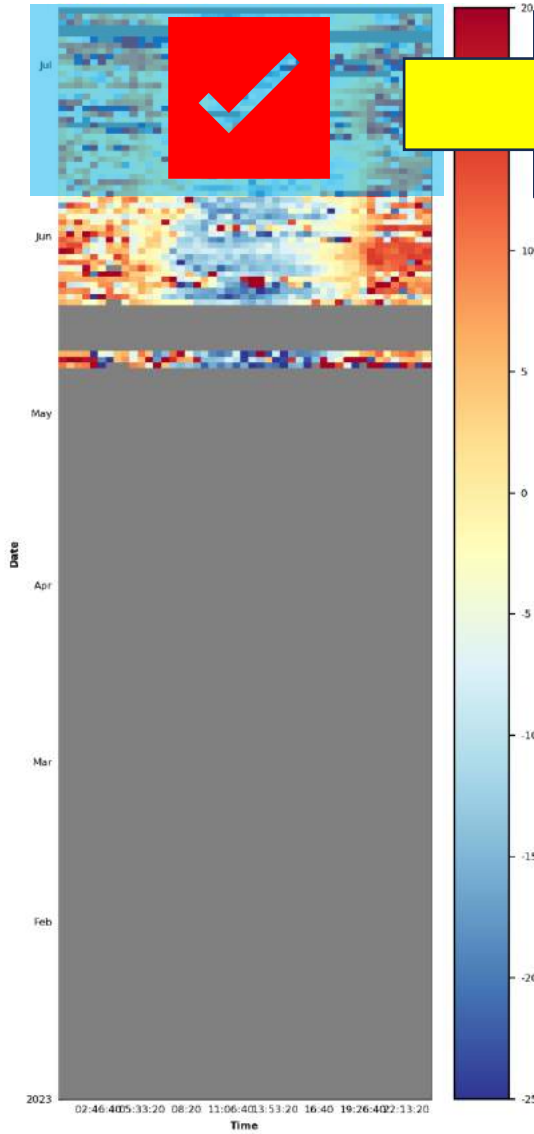


- Both systems measure similar fluxes under normal (no issues) conditions
- We can merge the two time series to one complete time series
- The parallel system replaces data from the main system from 12 Jun onwards (see next slide)

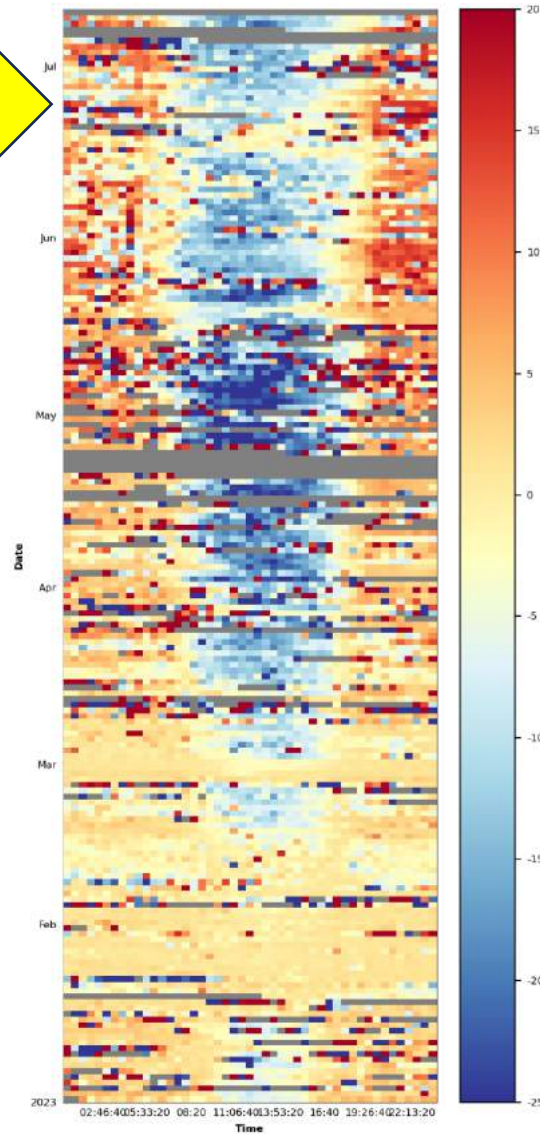
MAIN TOWER (sonicread)



PARALLEL MEASUREMENTS (rECord)



MAIN TOWER replaced with PARALLEL data from 12 Jun onwards



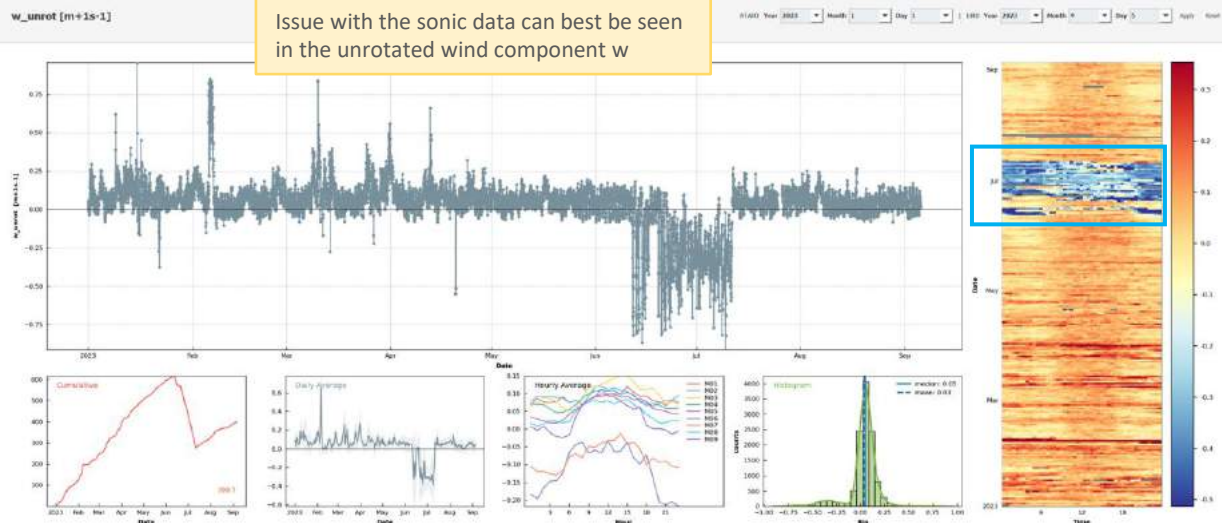
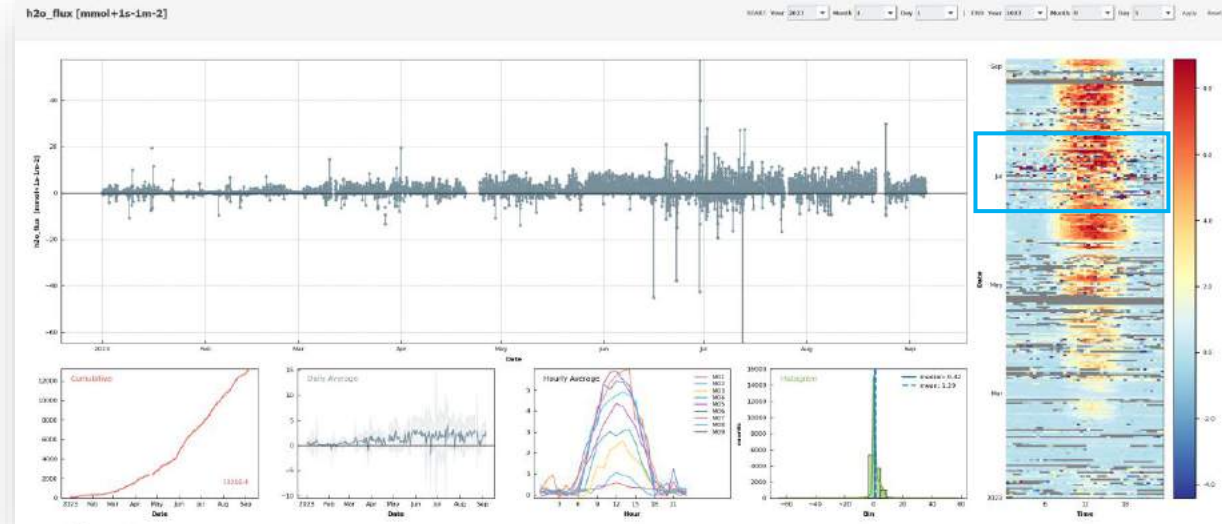
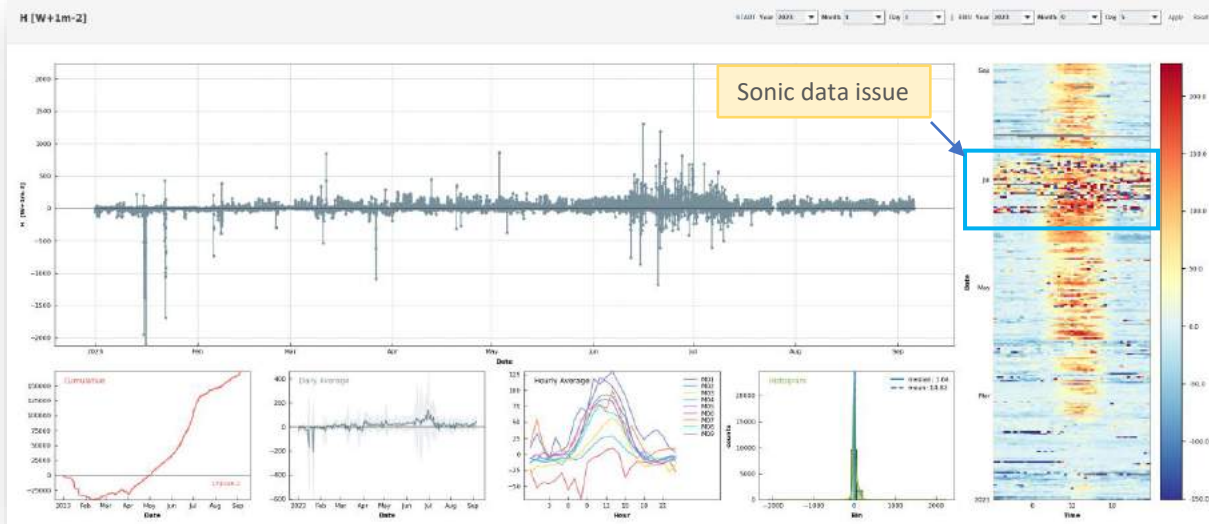
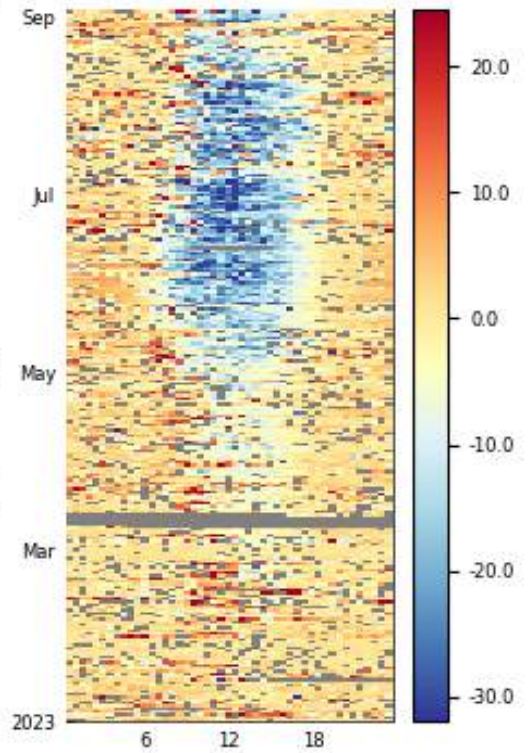
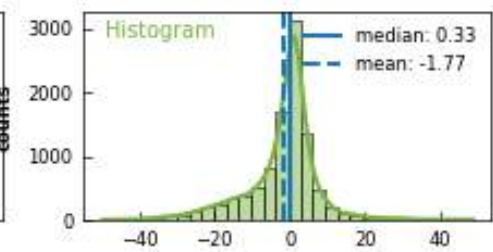
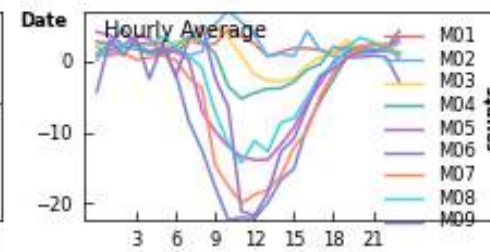
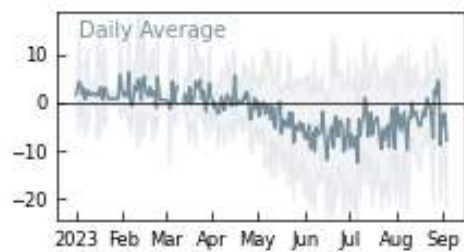
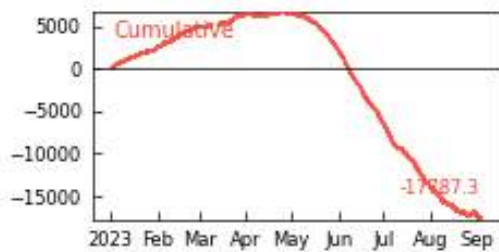
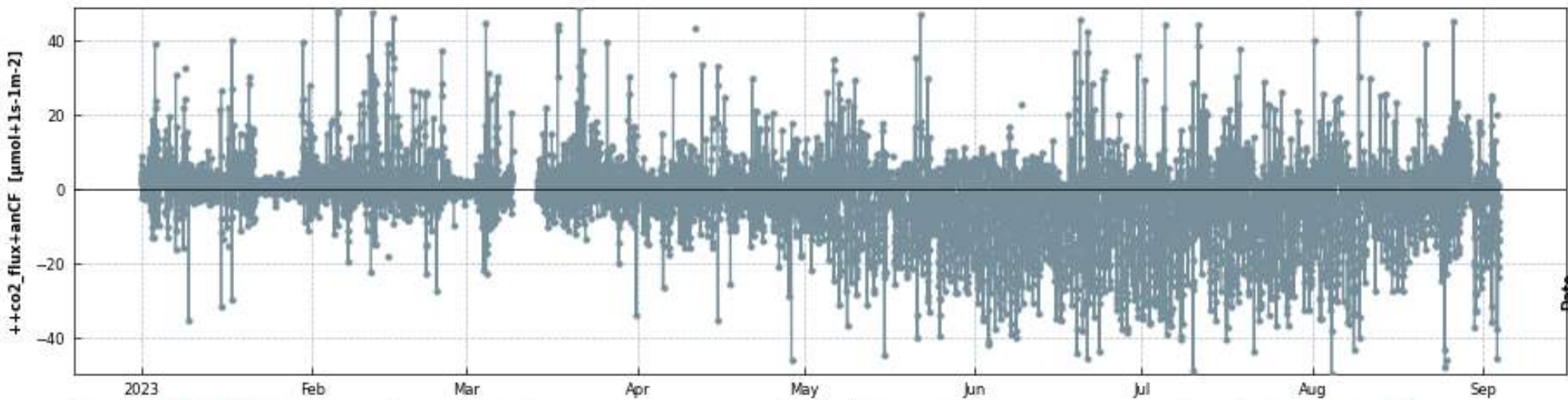
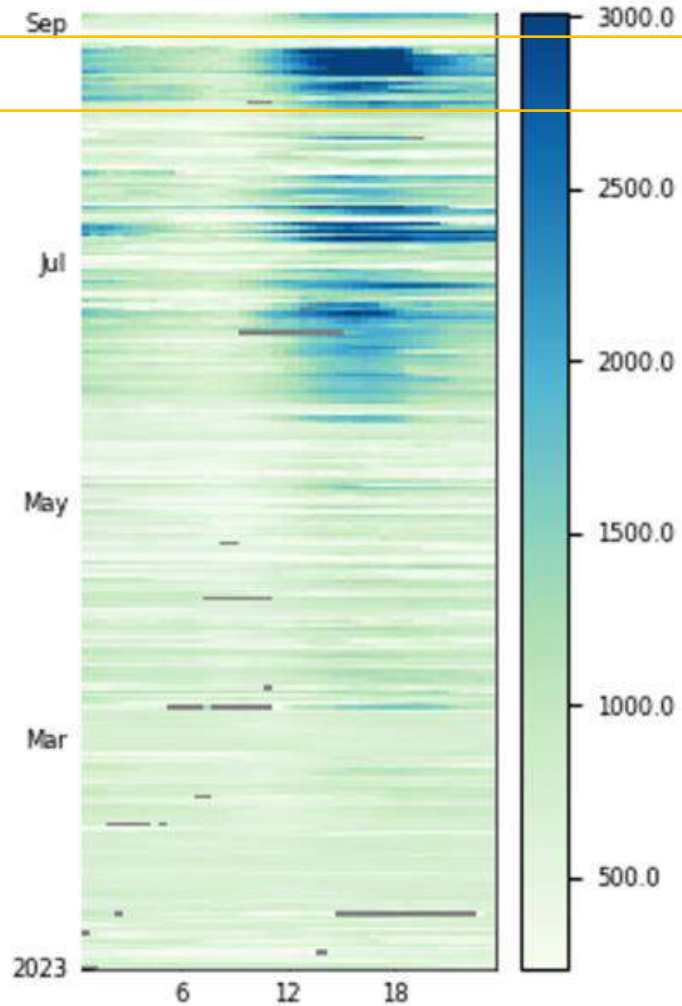




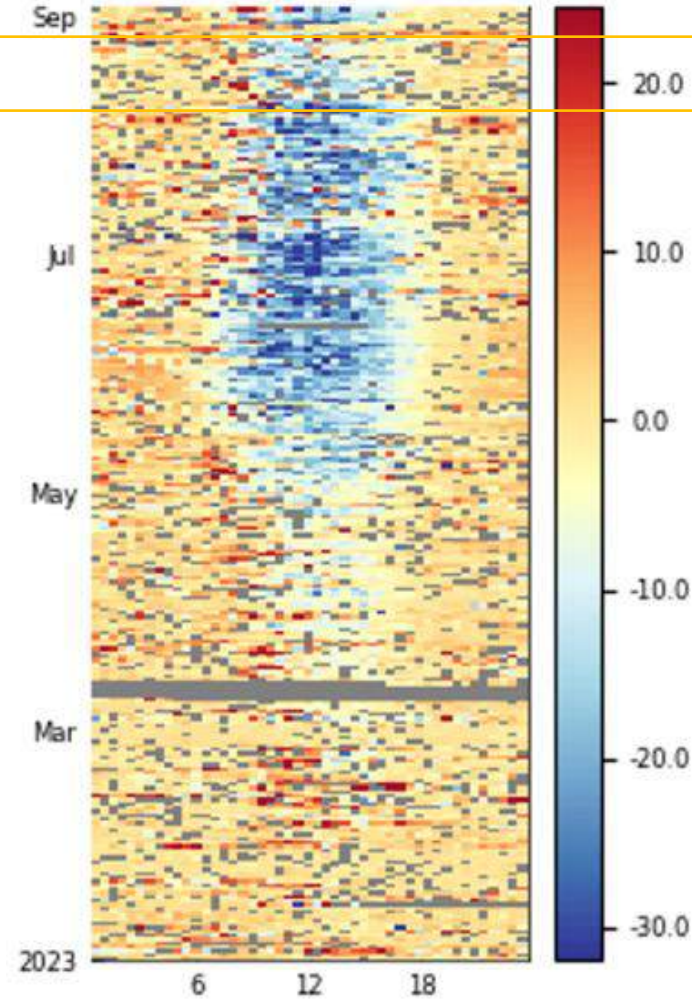
Photo: Markus Staudinger



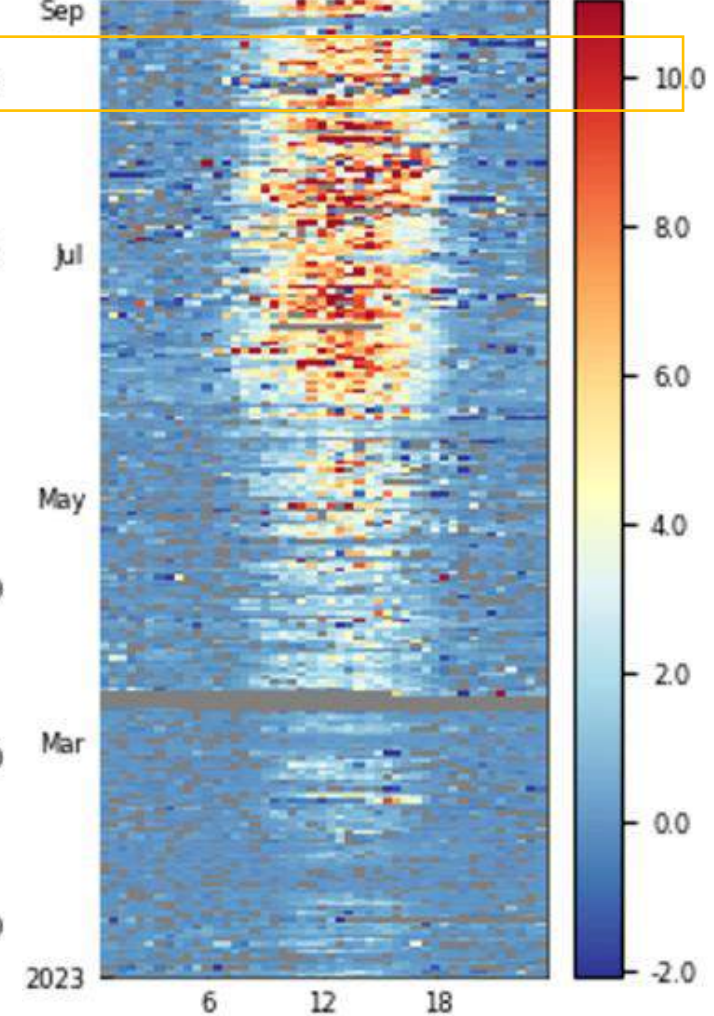
VPD

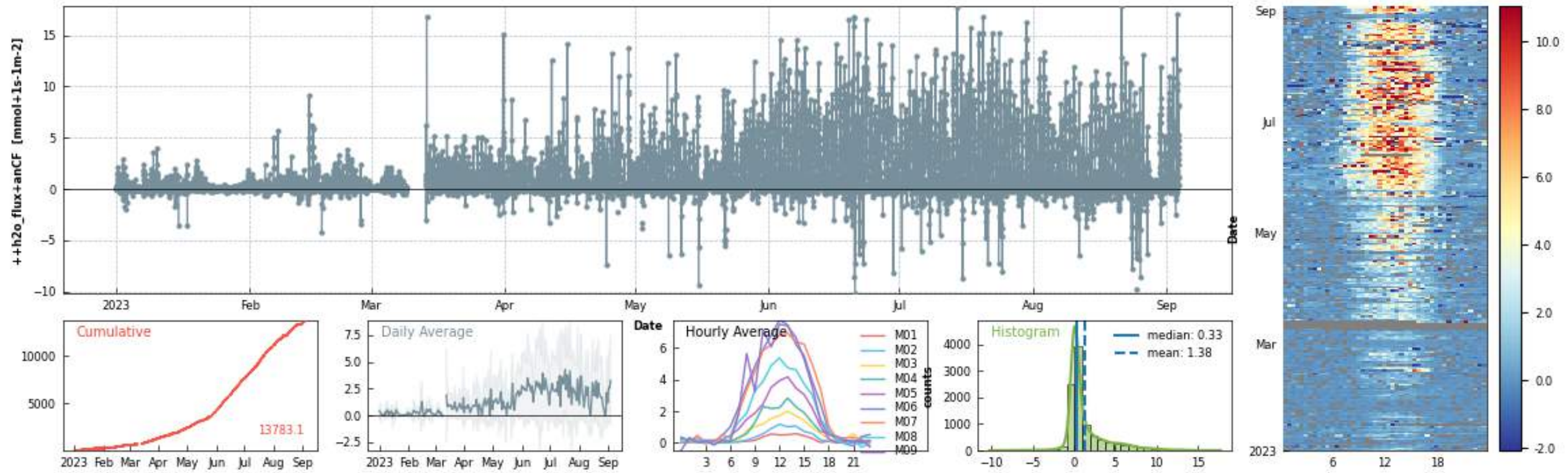


CO2 flux



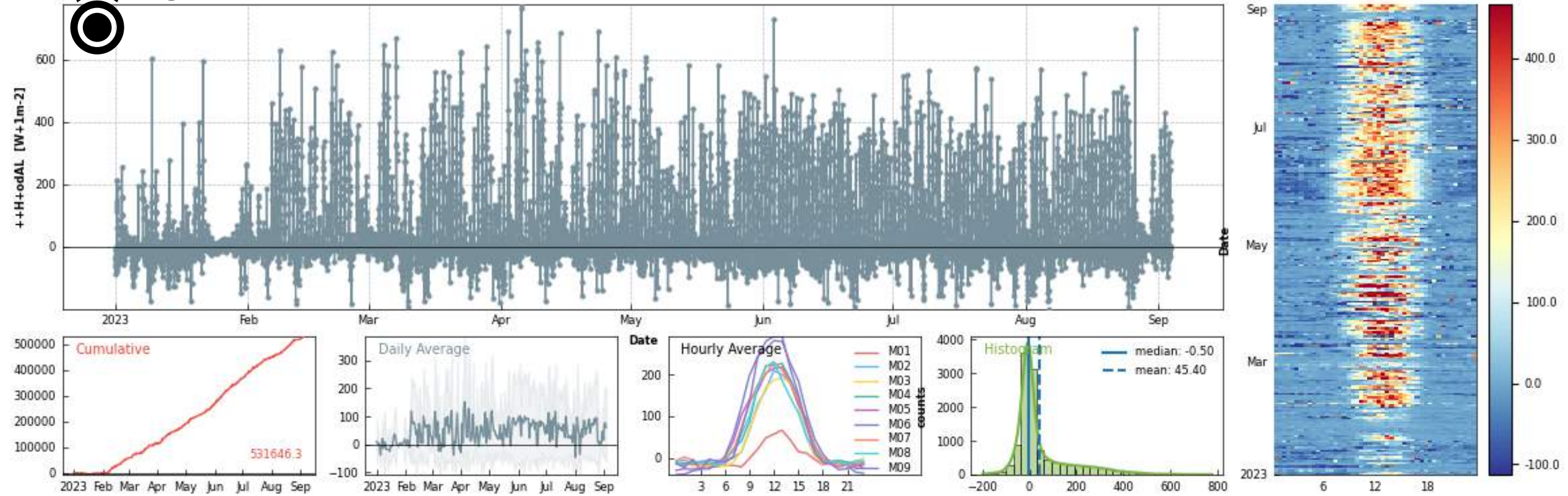
H2O flux







Highest sensible heat flux in Swiss FluxNet



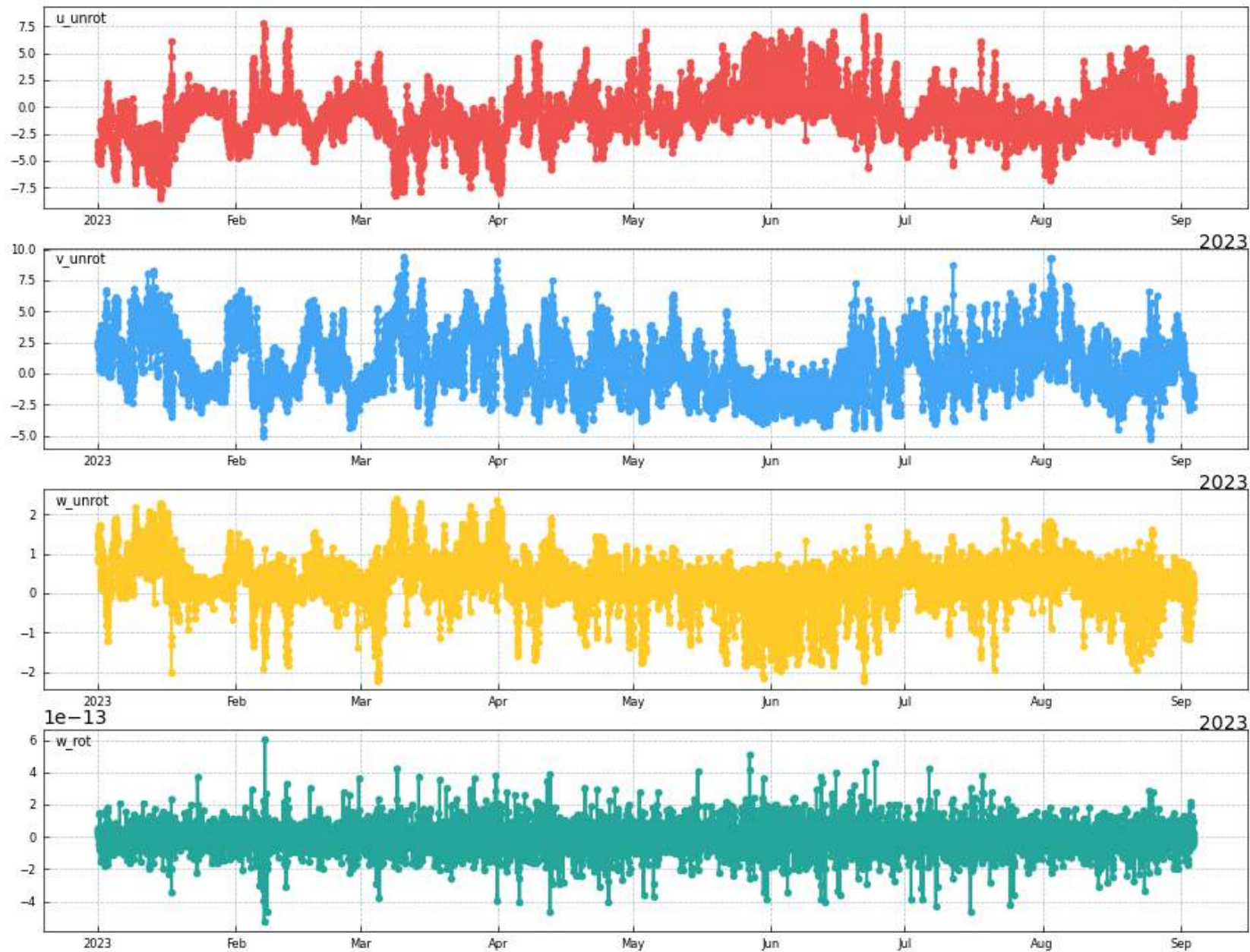
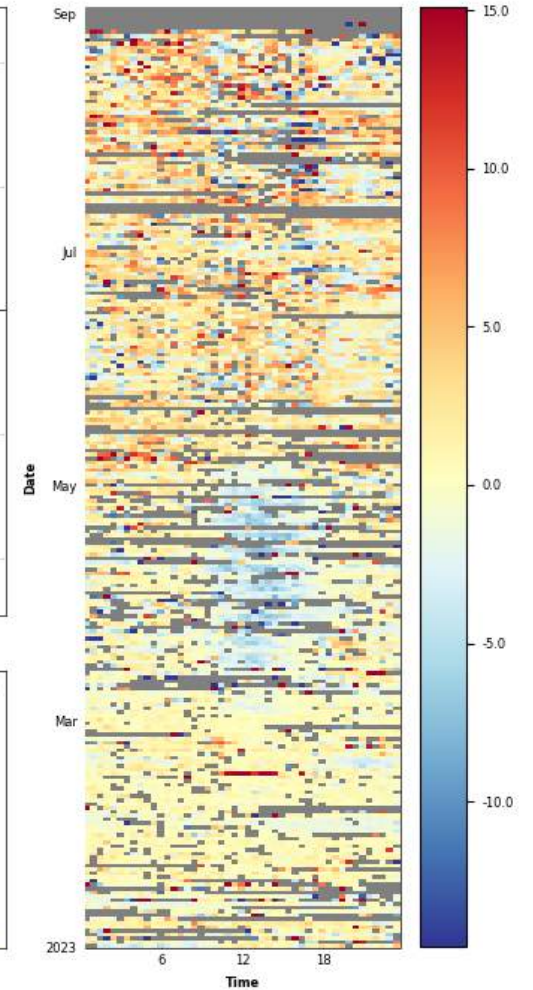
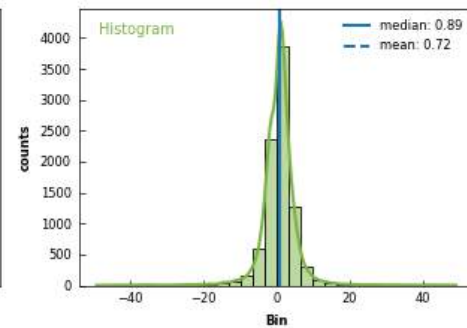
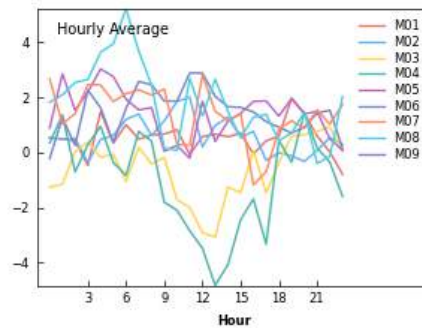
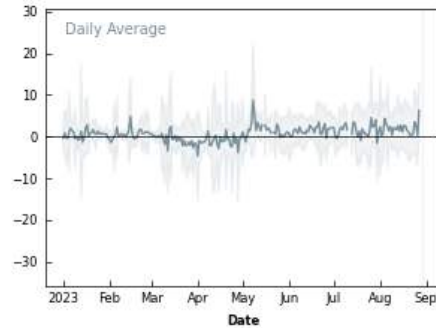
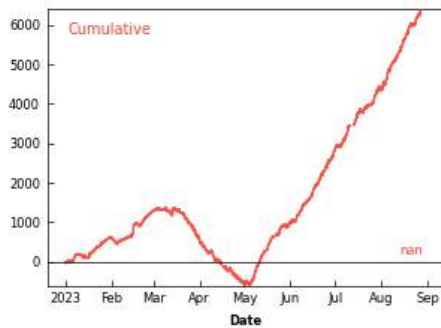
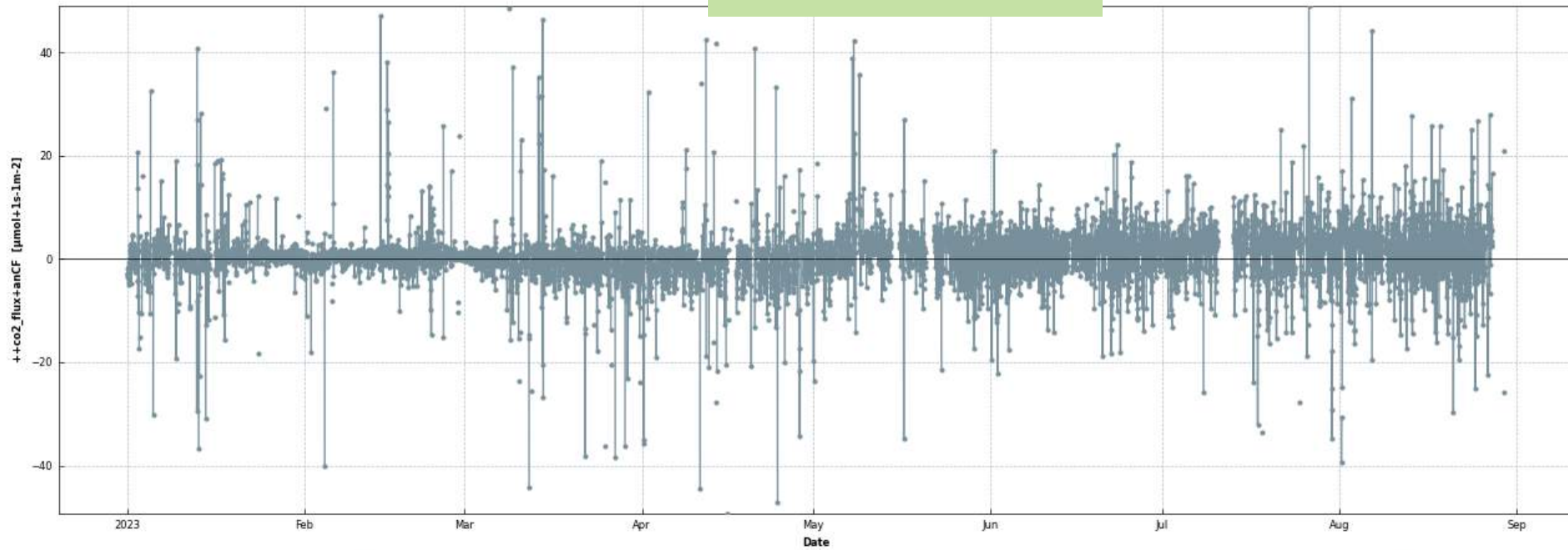


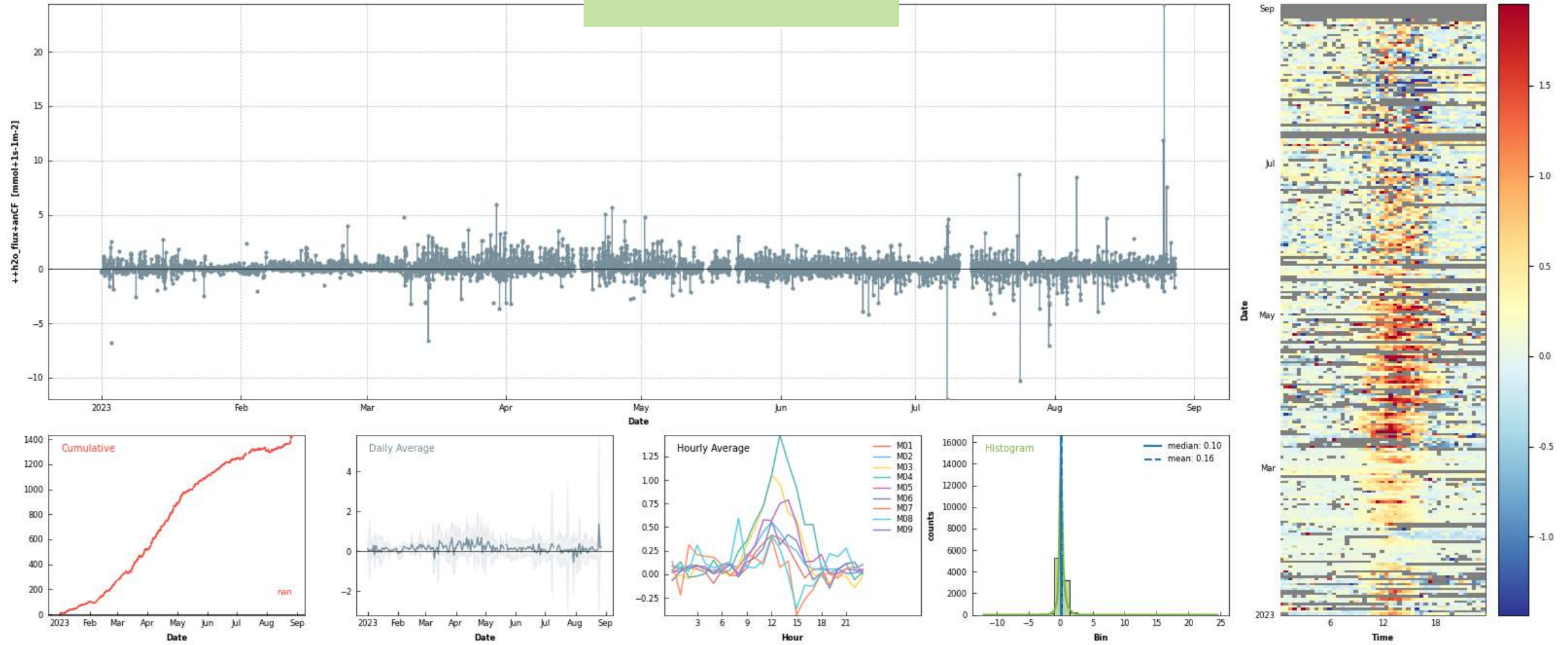


Photo: ETH GL Group

Quality checked



Quality checked



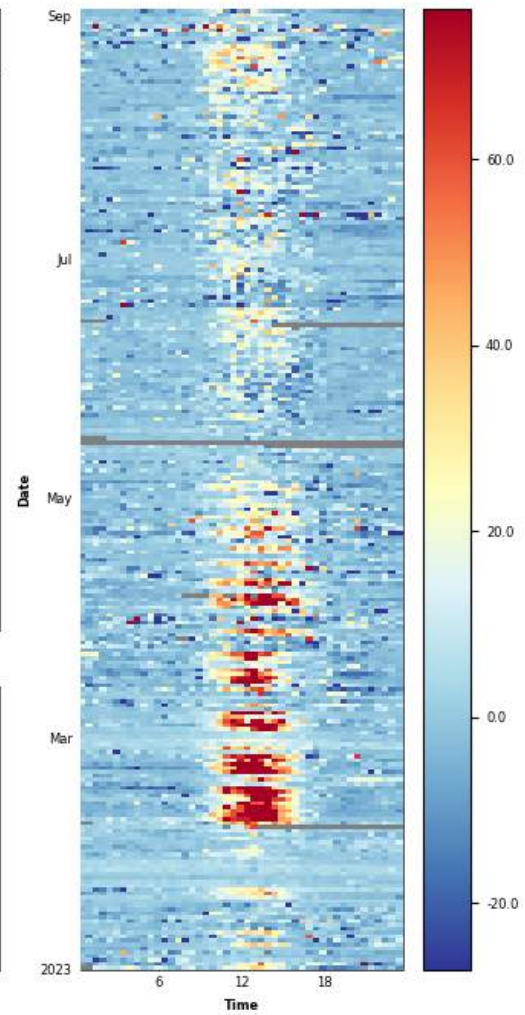
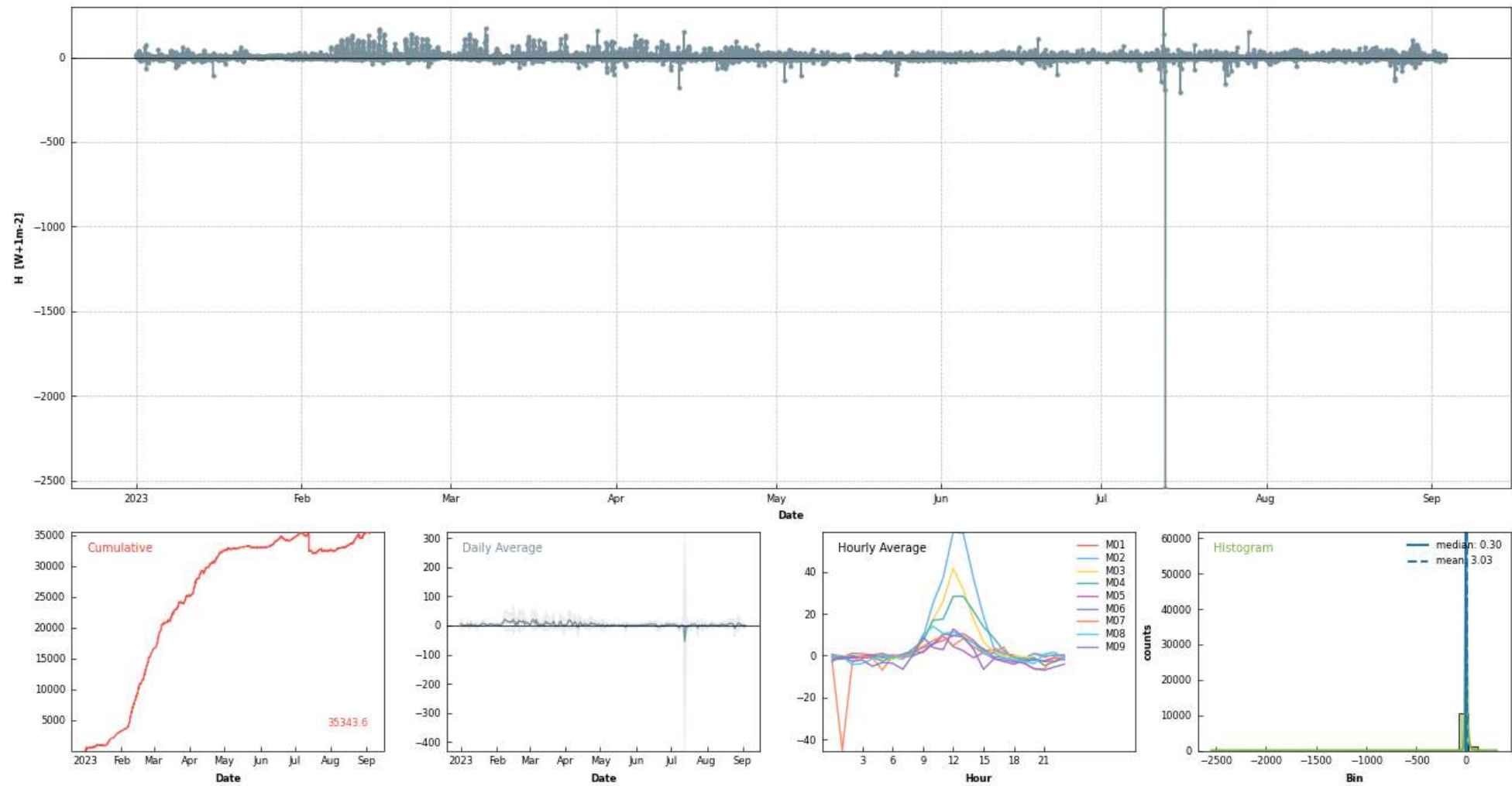
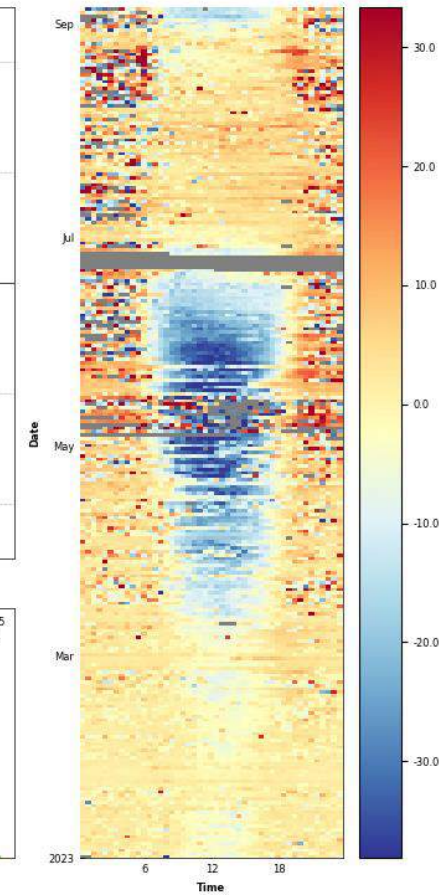
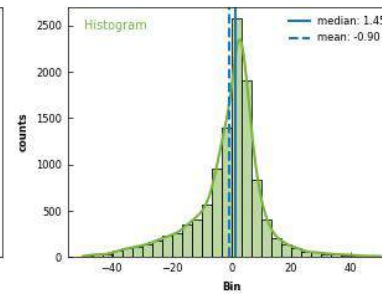
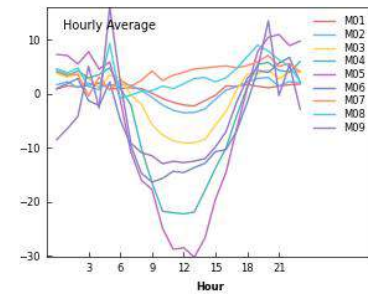
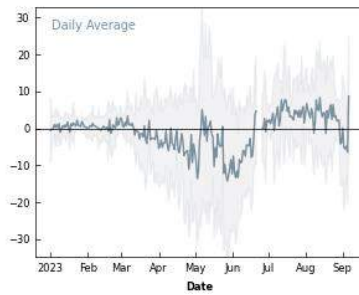
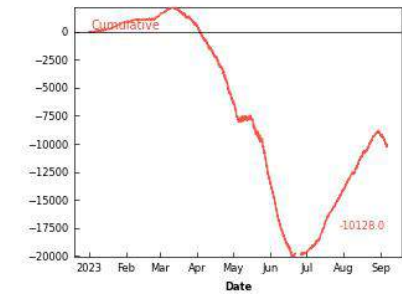
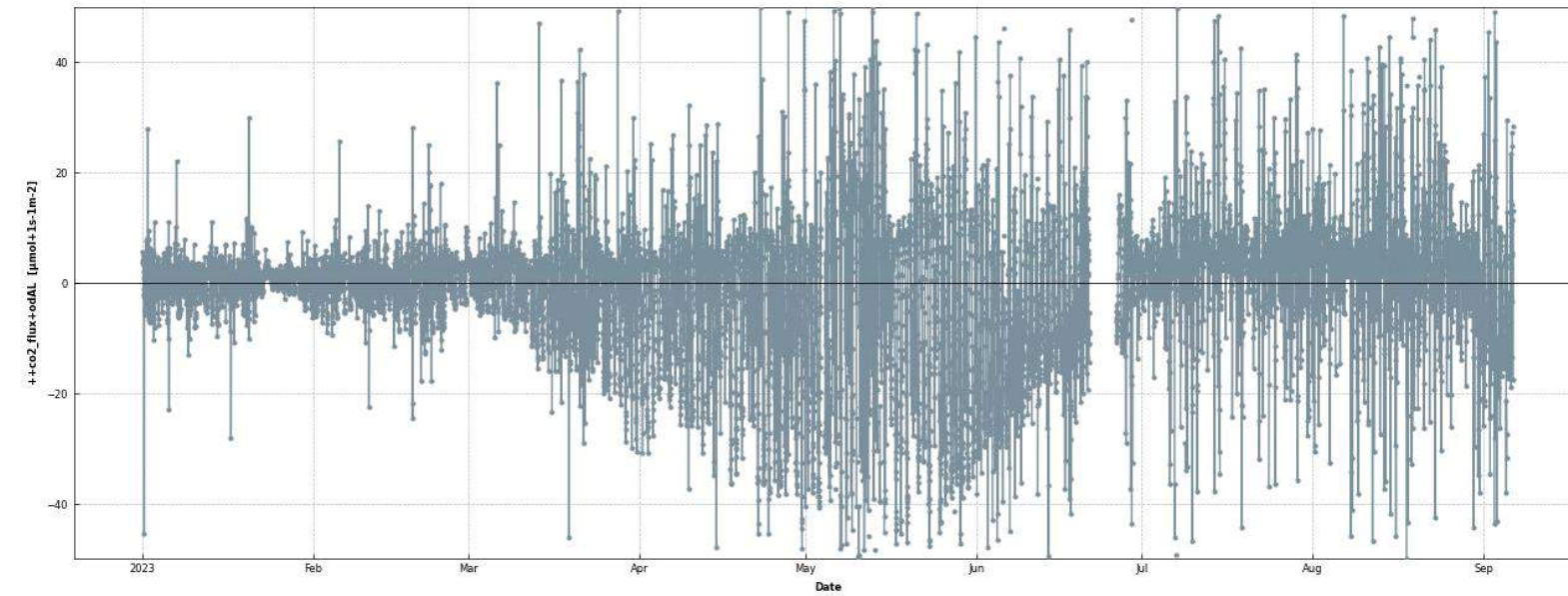




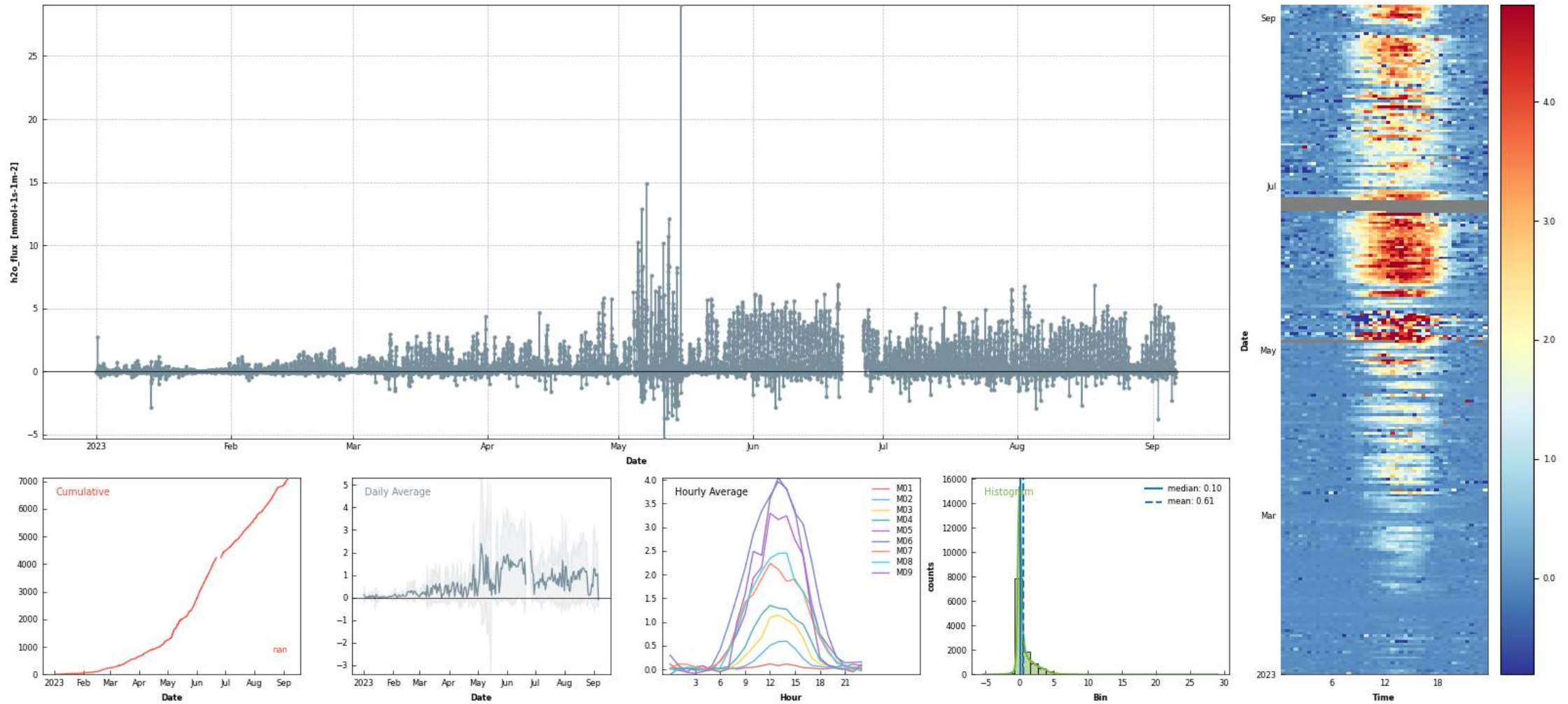


Photo: Regine Maier

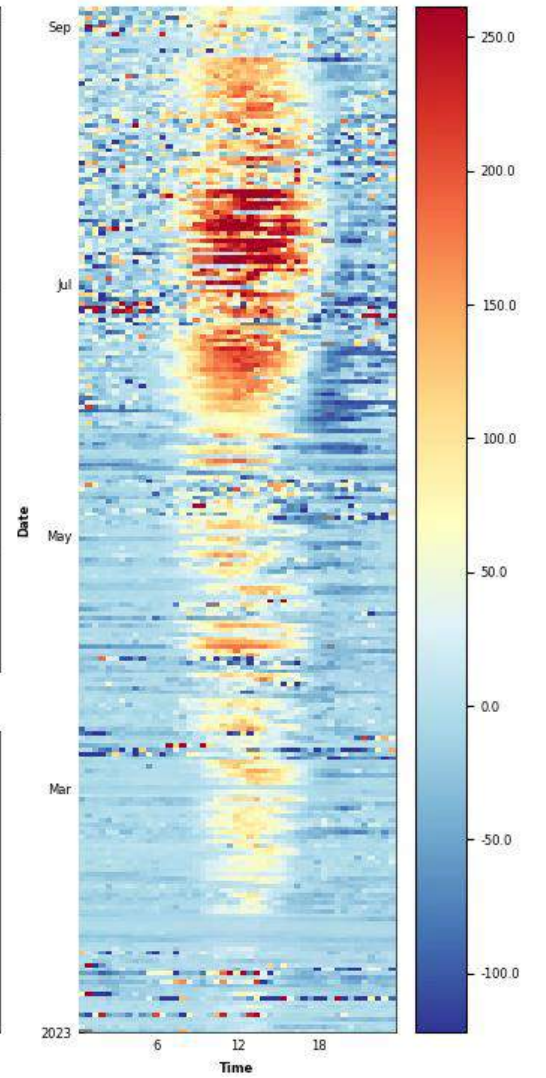
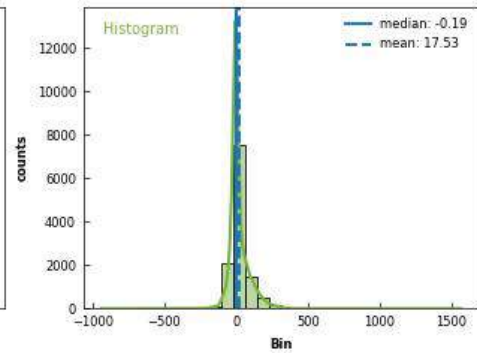
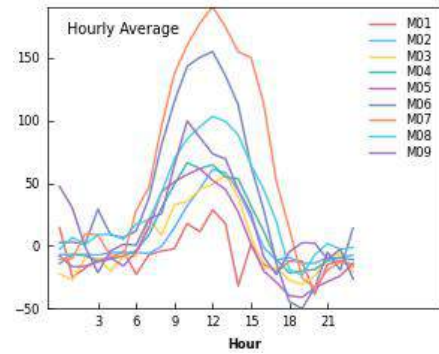
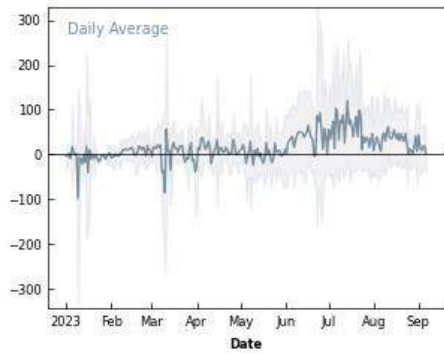
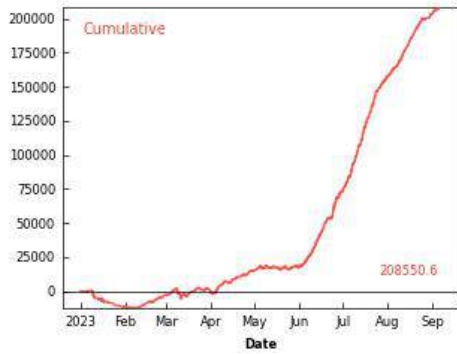
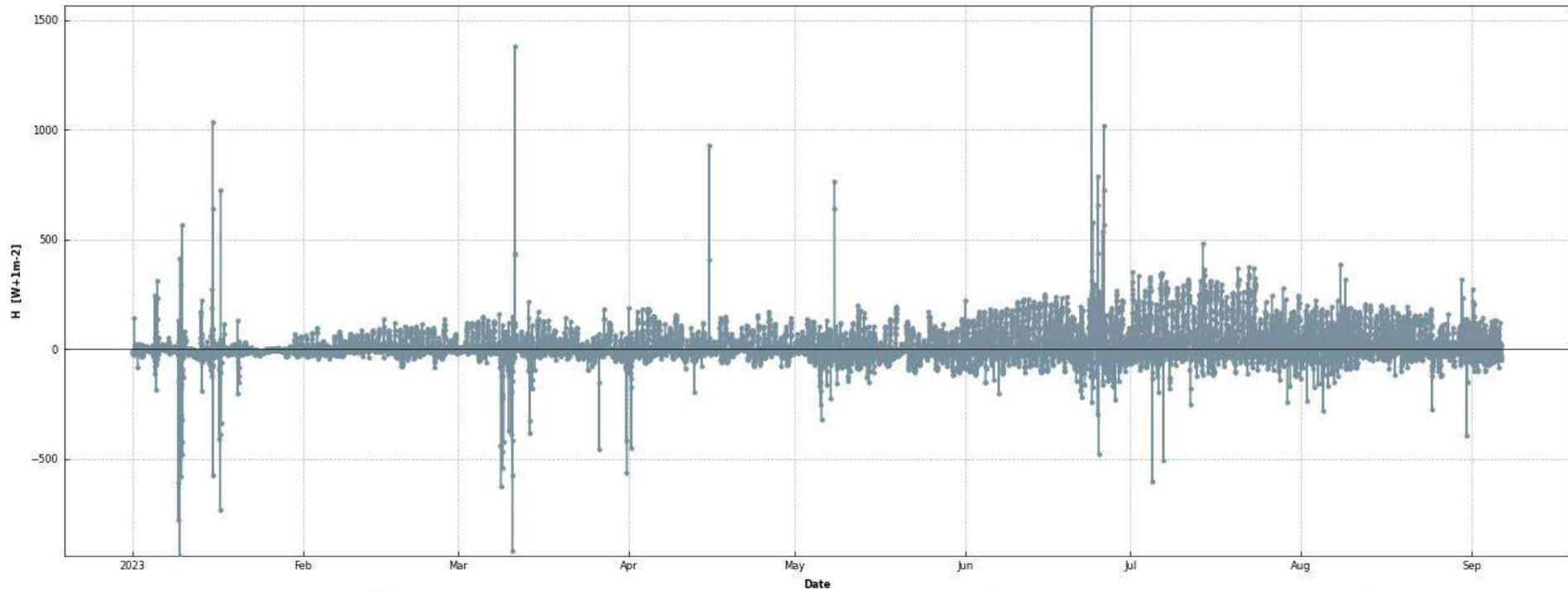
Absolute limits applied (-50, 50)



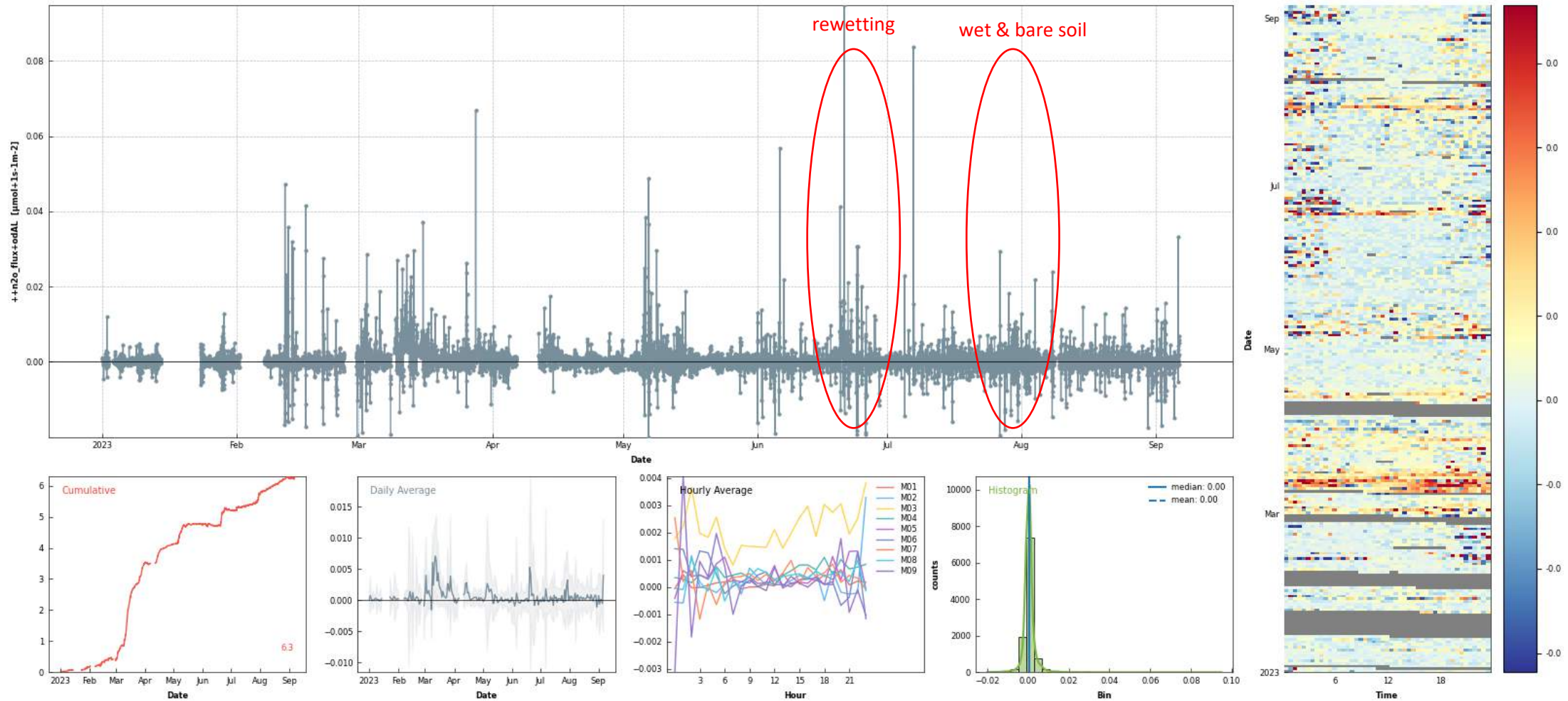
- 15.07 wheat harvest
- 18.07 soil cultivation
- 28.07 sowing of cover crop (mixture)



- 15.07 wheat harvest
- 18.07 soil cultivation
- 28.07 sowing of covercrop (mixture)



Absolute limits applied (-0.02, 0.1)



- 15.07 wheat harvest
- 18.07 soil cultivation
- 28.07 sowing of covercrop (mixture)

