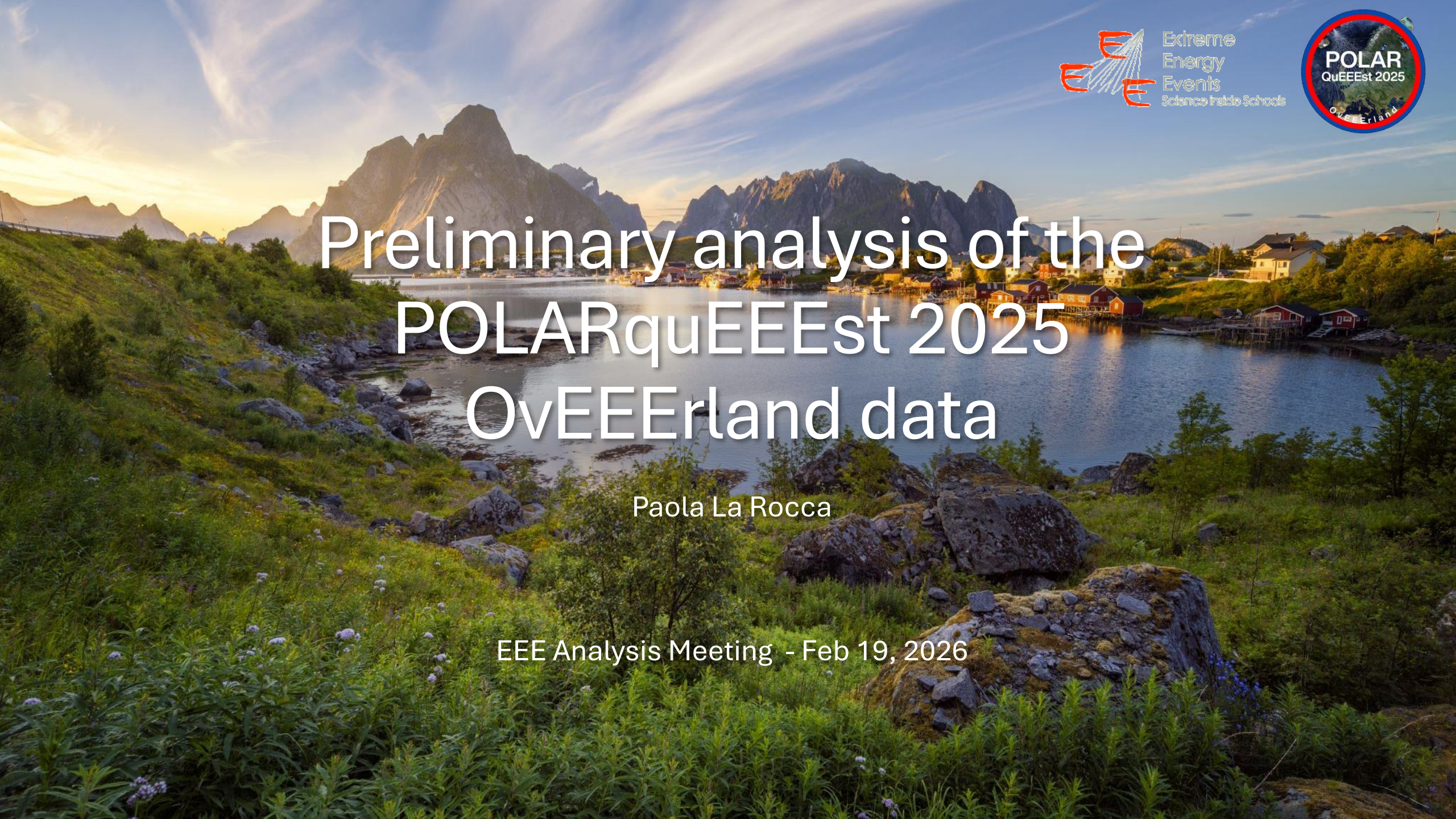


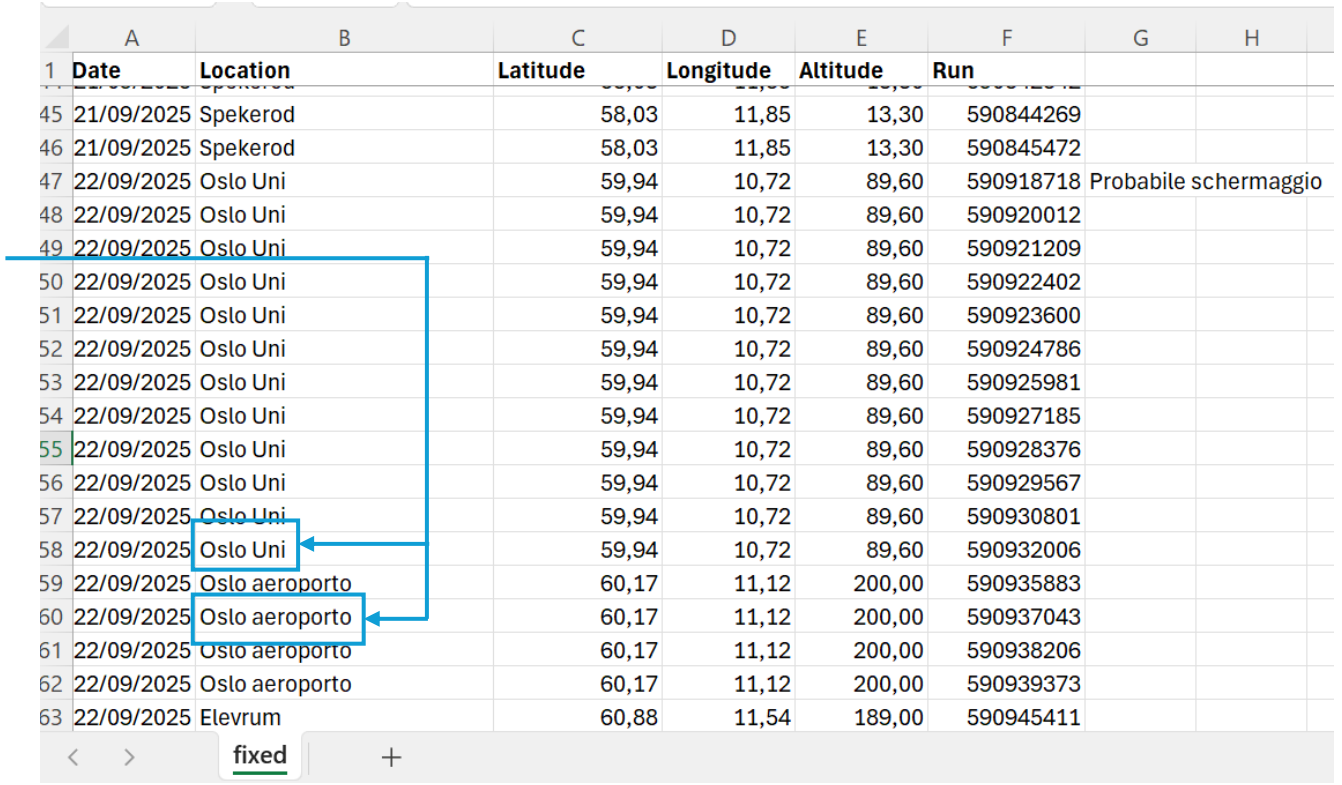
Preliminary analysis of the POLARquEEEst 2025 OvEEErland data

Paola La Rocca

EEE Analysis Meeting - Feb 19, 2026

Measurements @ fixed positions

- Total number of runs: 452 (moving) + 270 (fixed)
- Excel with info about fixed locations (52 in total, some of them repeated)
- Excluded from the anaysis:
  2025-10-08_592329431.root
  2025-10-08_592330879.root
  (measurements out of the car in Bologna)
- Rates evaluated in 1-minute steps (5329 values)



	A	B	C	D	E	F	G	H
1	**Date**	**Location**	**Latitude**	**Longitude**	**Altitude**	**Run**		
45	21/09/2025	Spekerod	58,03	11,85	13,30	590844269		
46	21/09/2025	Spekerod	58,03	11,85	13,30	590845472		
47	22/09/2025	Oslo Uni	59,94	10,72	89,60	590918718	Probabile schermaggio	
48	22/09/2025	Oslo Uni	59,94	10,72	89,60	590920012		
49	22/09/2025	Oslo Uni	59,94	10,72	89,60	590921209		
50	22/09/2025	Oslo Uni	59,94	10,72	89,60	590922402		
51	22/09/2025	Oslo Uni	59,94	10,72	89,60	590923600		
52	22/09/2025	Oslo Uni	59,94	10,72	89,60	590924786		
53	22/09/2025	Oslo Uni	59,94	10,72	89,60	590925981		
54	22/09/2025	Oslo Uni	59,94	10,72	89,60	590927185		
55	22/09/2025	Oslo Uni	59,94	10,72	89,60	590928376		
56	22/09/2025	Oslo Uni	59,94	10,72	89,60	590929567		
57	22/09/2025	Oslo Uni	59,94	10,72	89,60	590930801		
58	22/09/2025	Oslo Uni	59,94	10,72	89,60	590932006		
59	22/09/2025	Oslo aeroporto	60,17	11,12	200,00	590935883		
60	22/09/2025	Oslo aeroporto	60,17	11,12	200,00	590937043		
61	22/09/2025	Oslo aeroporto	60,17	11,12	200,00	590938206		
62	22/09/2025	Oslo aeroporto	60,17	11,12	200,00	590939373		
63	22/09/2025	Elevrum	60,88	11,54	189,00	590945411		

fixed

Selection of the quality cuts

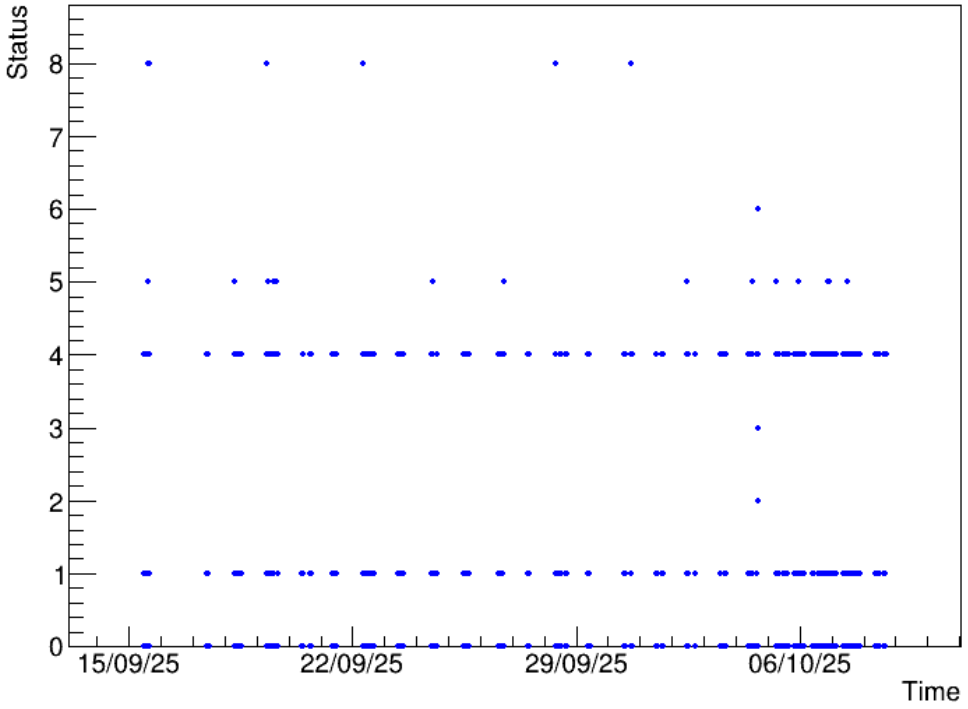
Analysis on Vespucci data:

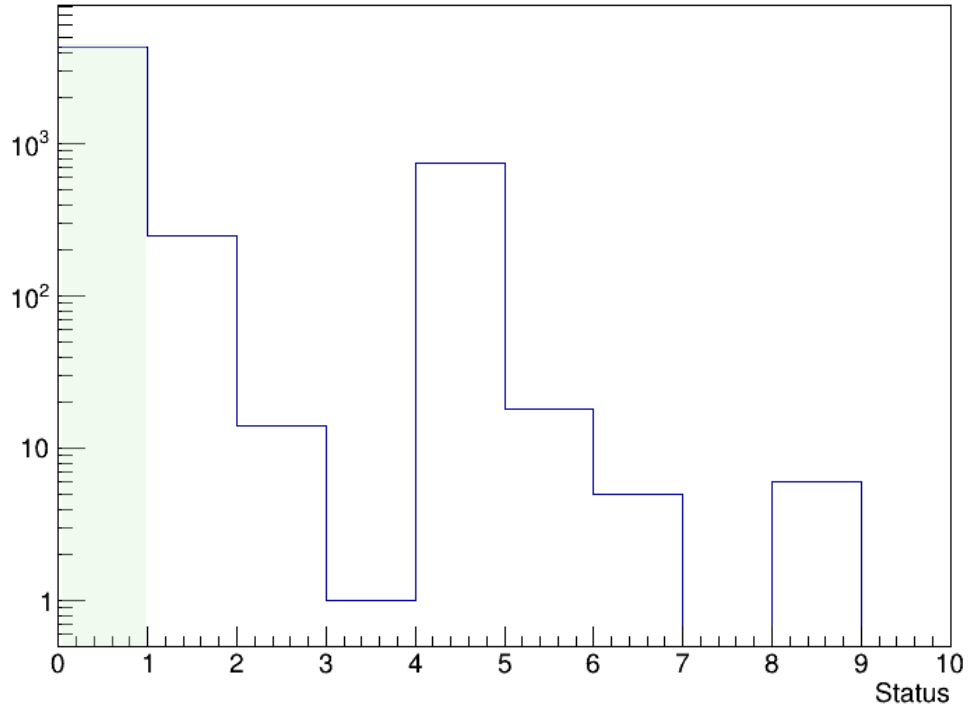
- Status == 0
- Duration == 60
- abs(rateRaw-parRates[0]) < 2
- pres> 800 && < 1100
- Temp AND temp2> 15 && < 40 → **to be optimized for the Norway campaign**

Quality plots - Status

Quality cut: status == 0

(1039 values rejected, corresponding to 19.5%)

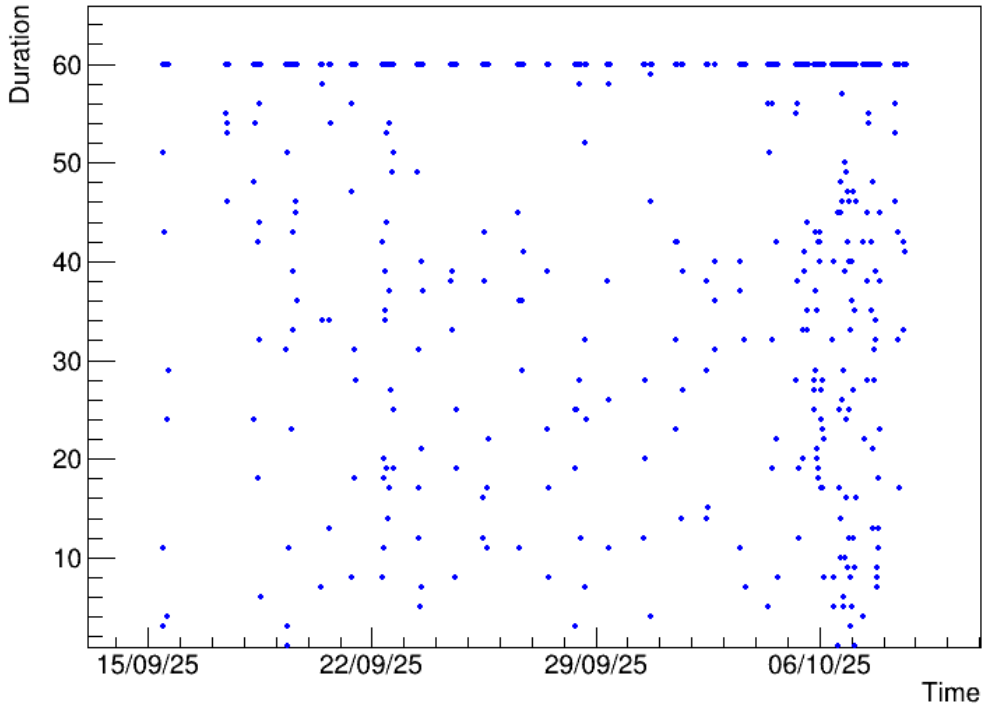


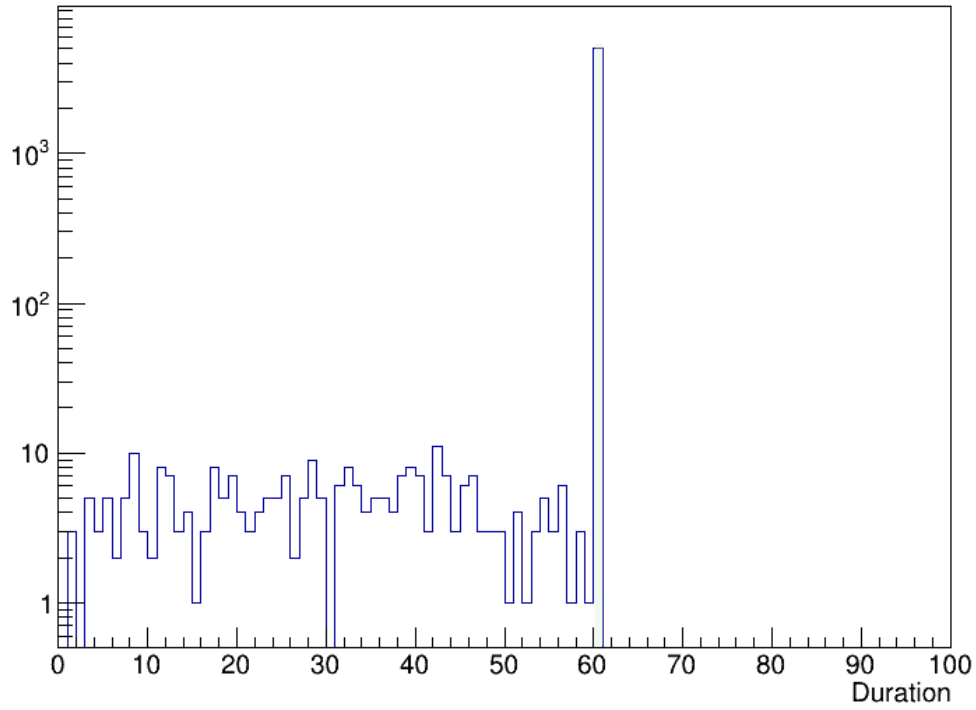


Quality plots - Duration

Quality cut: duration == 60

(266 values rejected, corresponding to 5%)

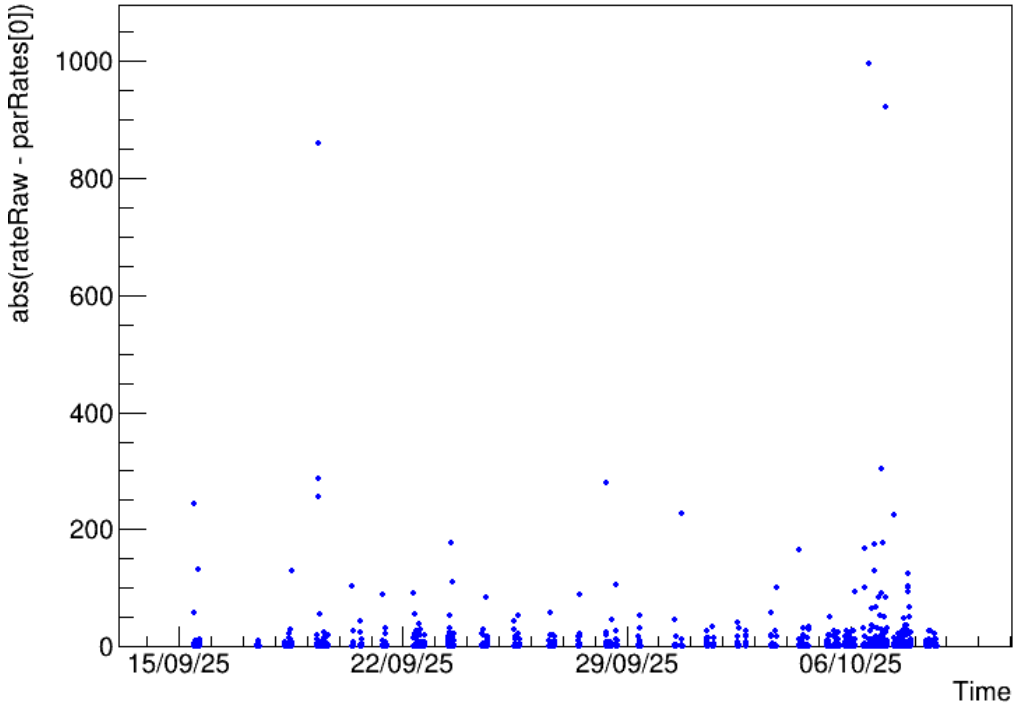


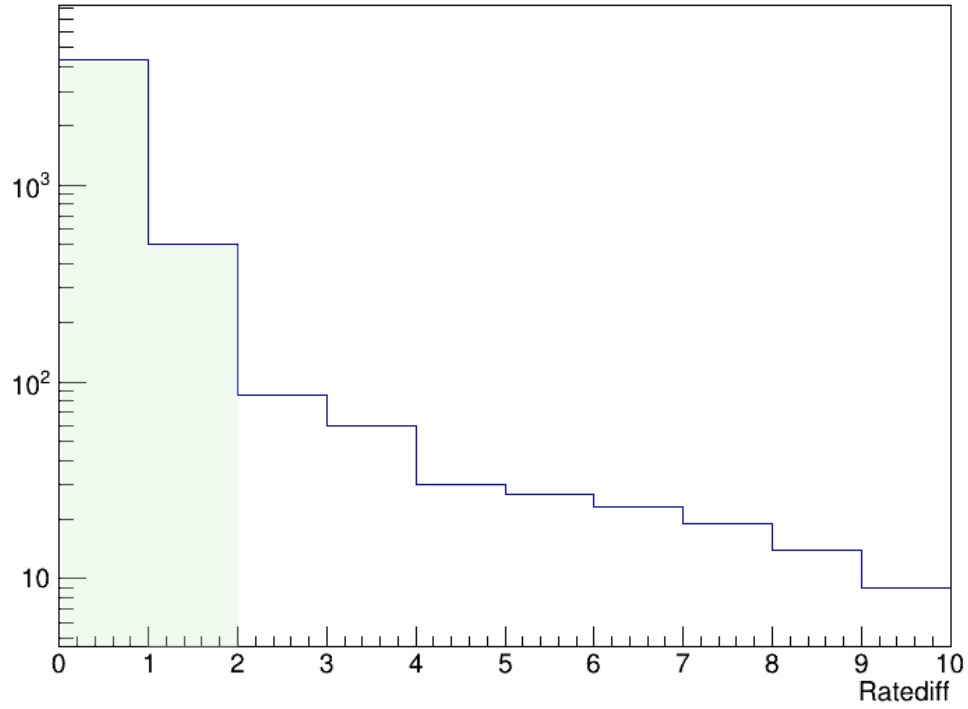


Quality plots - abs(rateRaw-parRates[0])

Quality cut: abs(rateRaw-parRates[0]) < 2

(503 values rejected, corresponding to 9.4%)

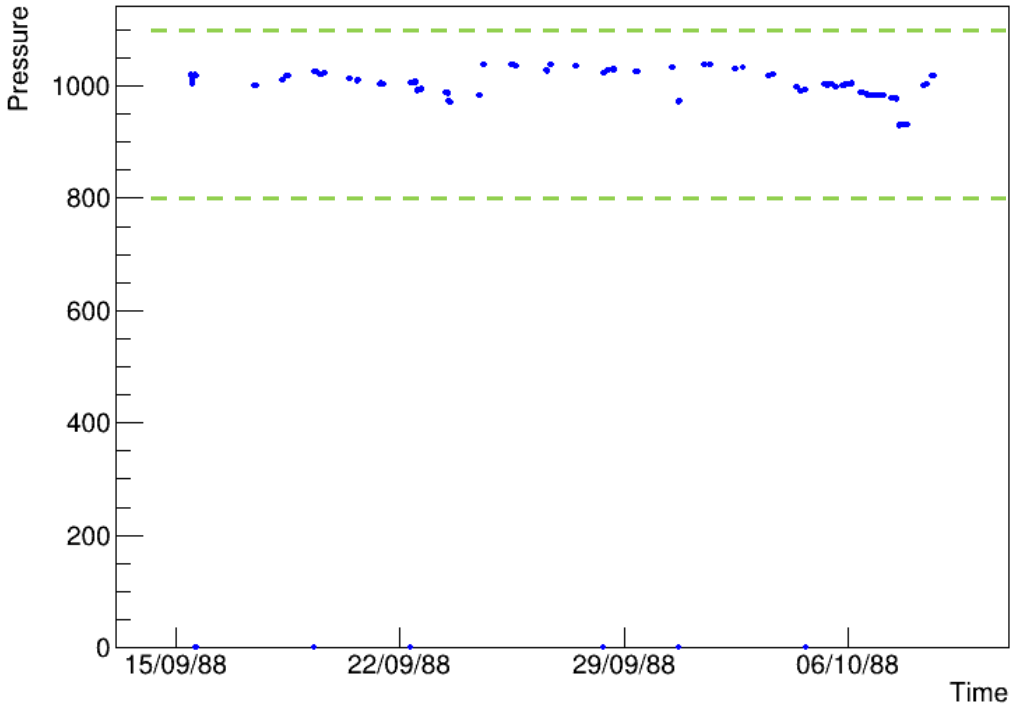


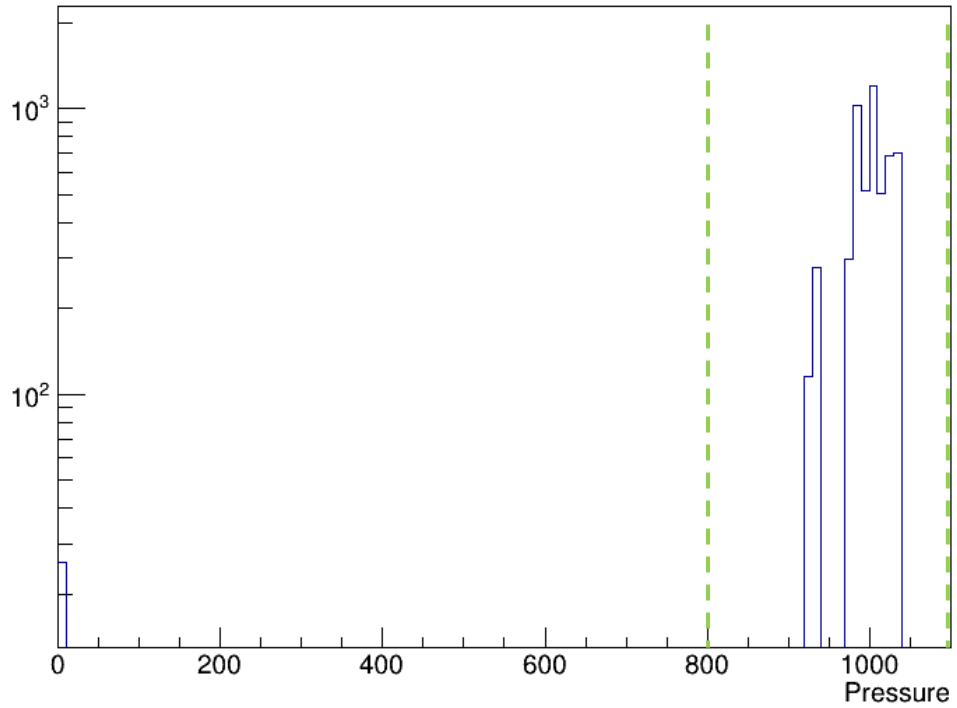


Quality plots - Pressure

Quality cut: pres> 800 && pres < 1100

(26 values rejected, corresponding to o.5%)





Summary of the first quality cuts

Cuts applied in the following order:

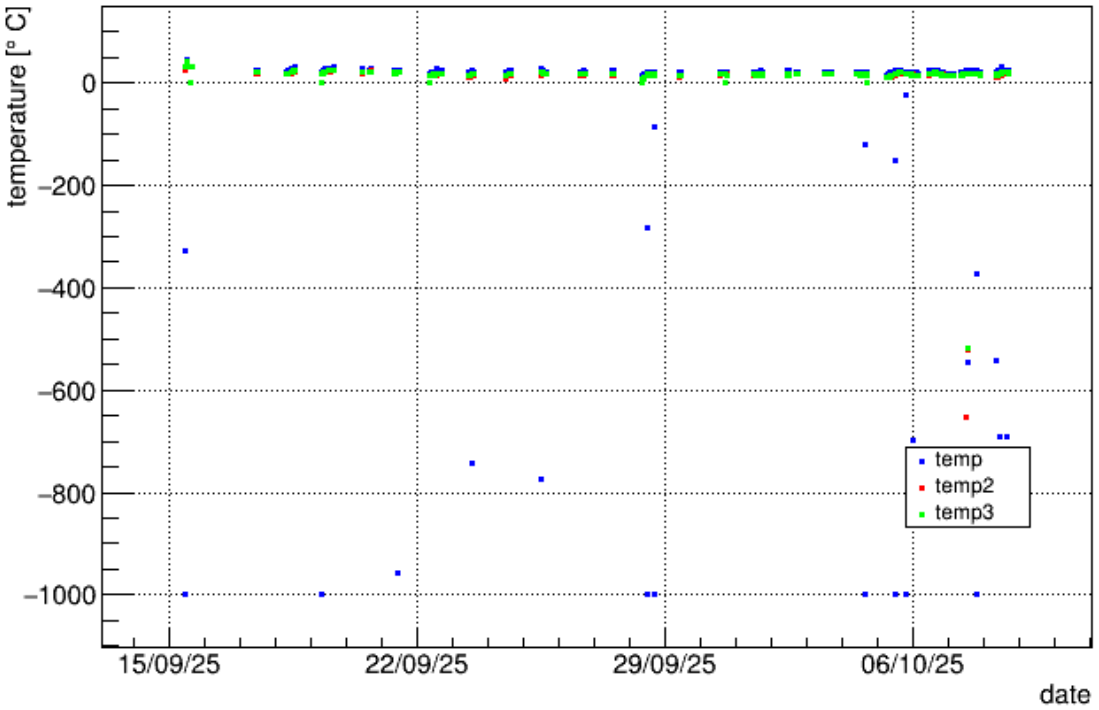
- Status == 0 → 19.5% of values rejected
- && duration == 60 → 0% of values rejected
- && abs(rateRaw-parRates[0]) < 2 → 1.9% of values rejected
- && pres> 800 && < 1100 → 0% of values rejected

1121 values rejected / 5329 = 21%

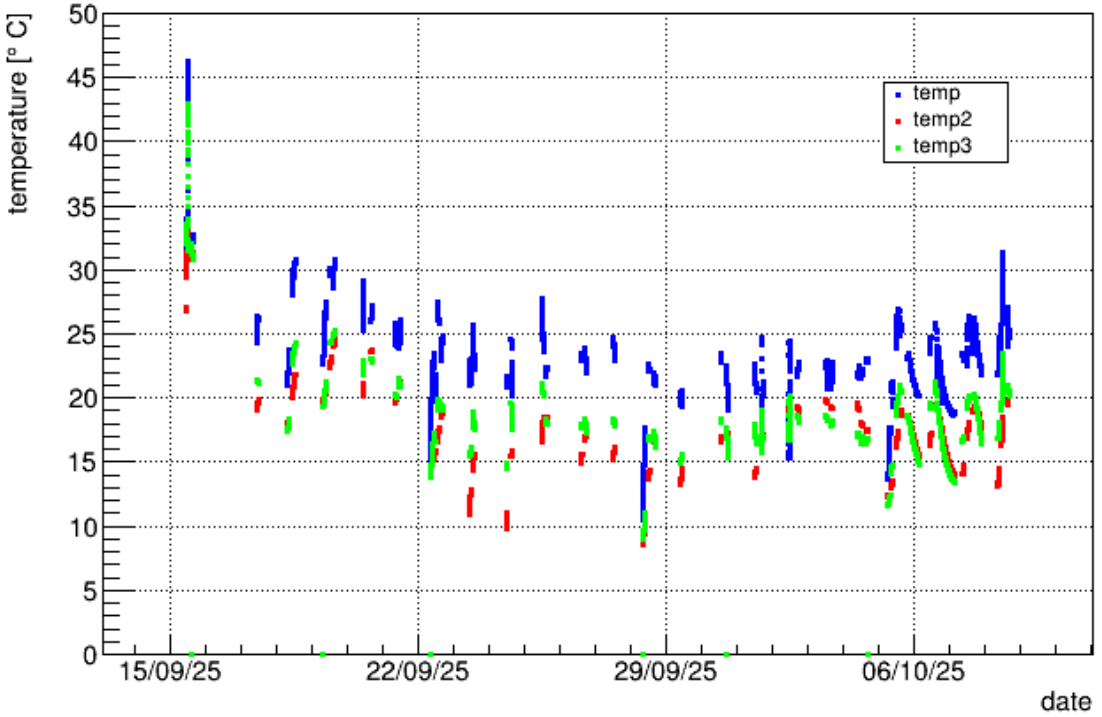
However additional cuts are needed!

Additional cut on temperature

Quality cuts applied (status, duration, rateRaw-parRates[0],pres)

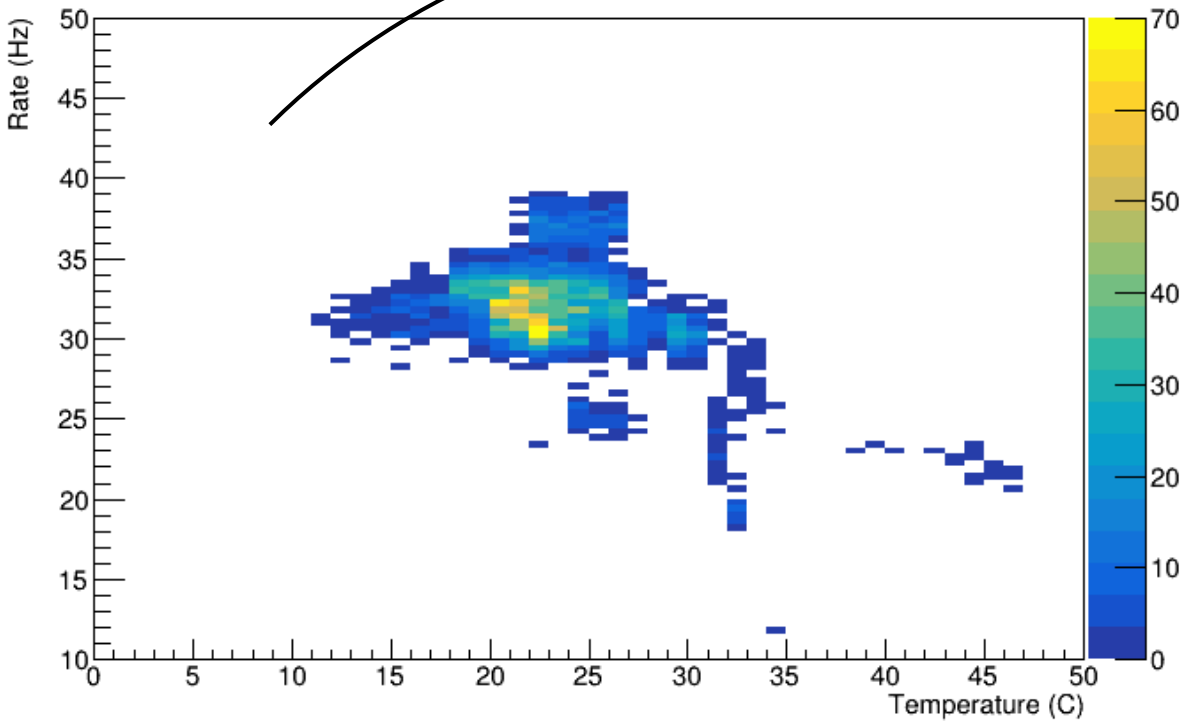


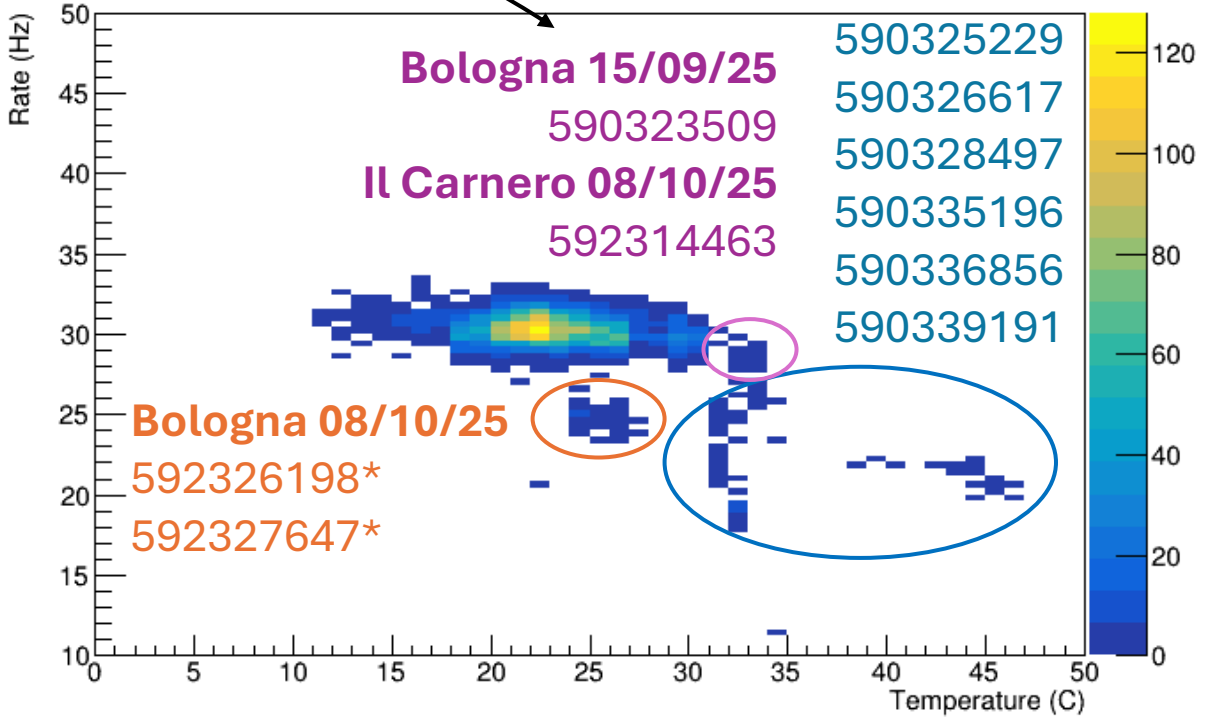
ZOOM



Additional cut on temperature

Correction for barometric effect
(β=-0.228 %/mbar, P_0=1026.03 mbar)



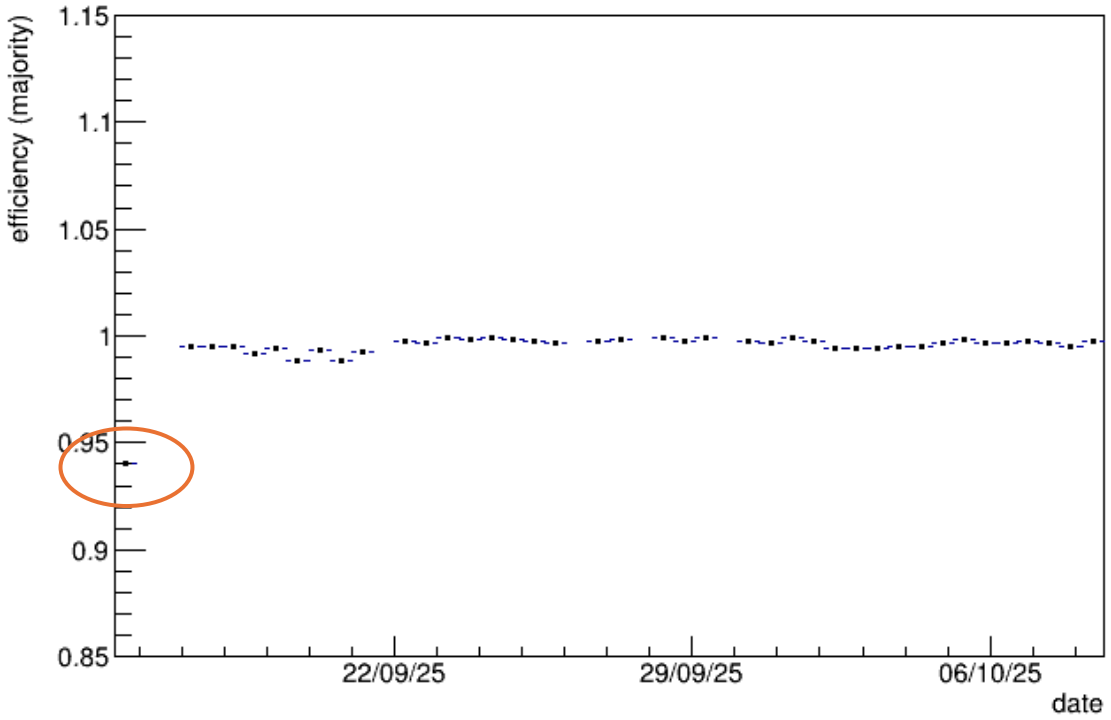


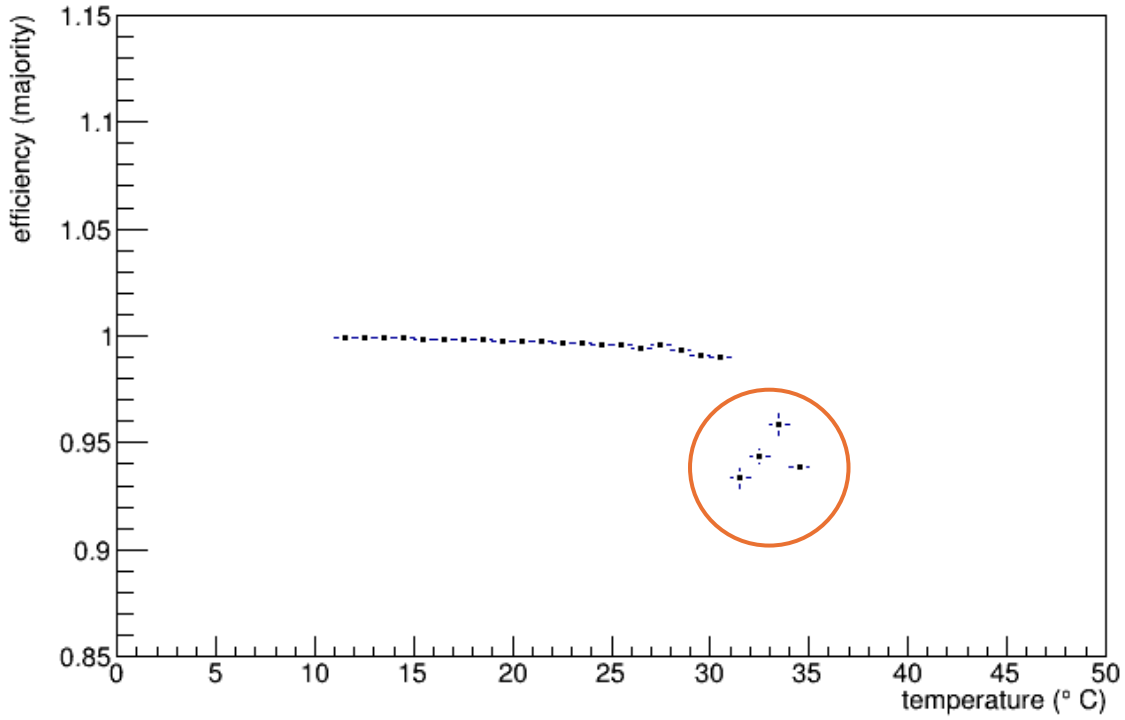
Tested 2 cuts on temperature :

- Tight cut: temp > 5 && temp < 31
- Loose cut: temp > 5 && temp < 37

* Close to the building?

Additional cut on temperature





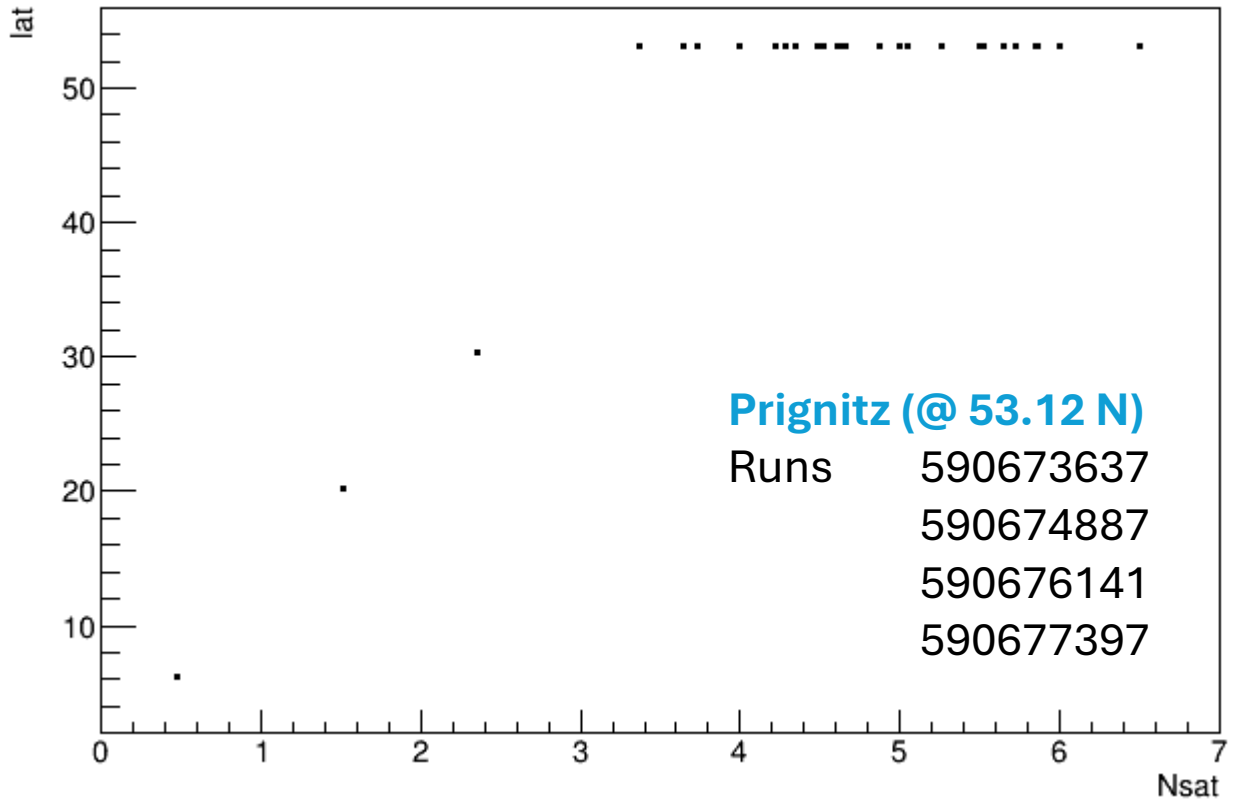
Drop of efficiency at temperatures > 31 → Selected cut: **temp > 5 && temp < 31**

Additional cut on Nsat

After applying the initial set of selection cuts, anomalous latitude values still observed

status == 0
duration == 60
abs(rateRaw-parRates[0]) < 2
pres> 800 && < 1100
temp > 5 && temp < 31

Additional cut: **Nsat >= 3**



Final summary of the quality cuts

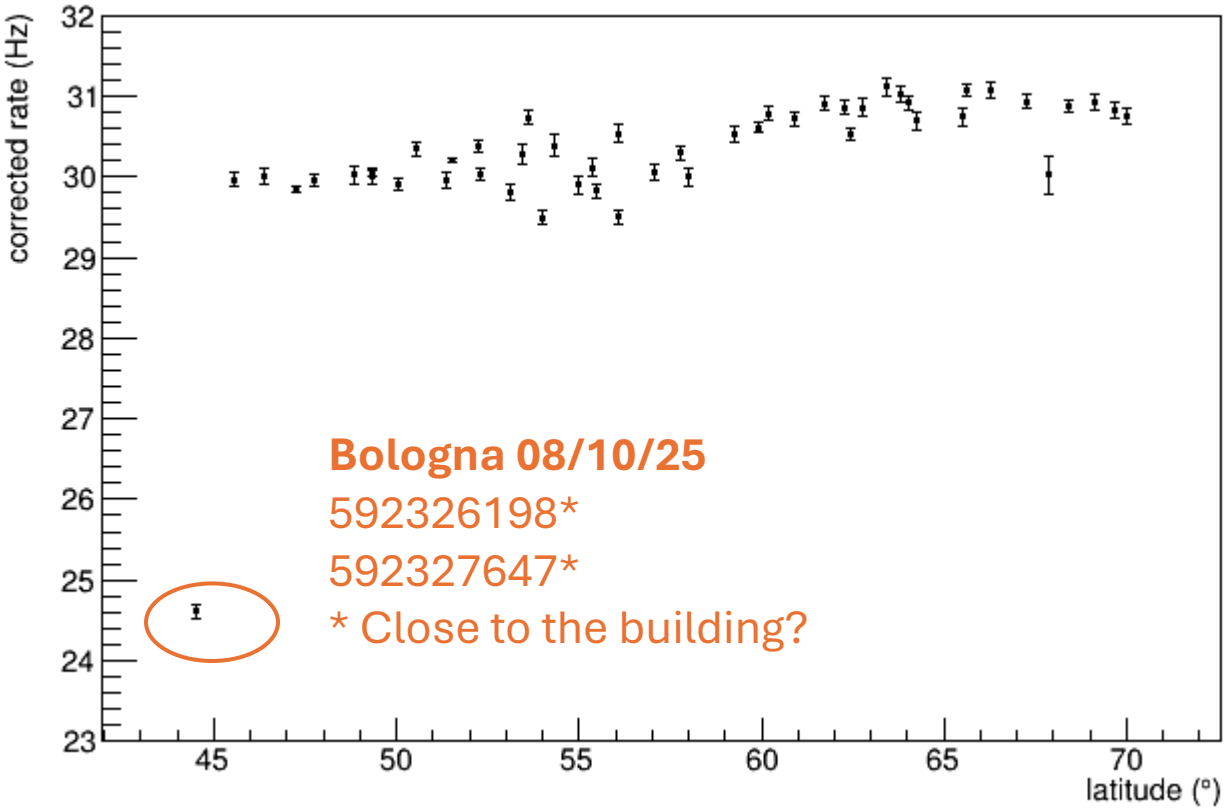
status == 0
duration == 60
abs(rateRaw-parRates[0]) < 2
pres> 800 && < 1100
temp > 5 && temp < 31
Nsat >= 3

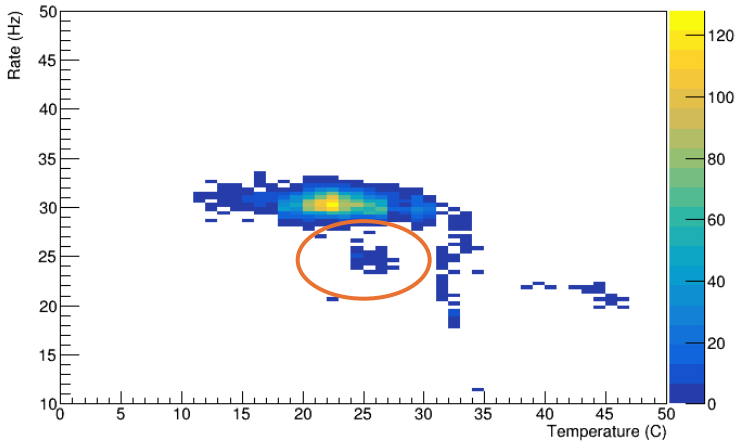
→ **1252 values rejected / 5329 = 23.5%**

Latitude dependence

- Quality cuts (status, duration, rateRaw-parRates[0], temp, pres, Nsat)
- Correction for the barometric effect (β=-0.228 %/mbar, P_0=1026.03 mbar)
- Average (and error) of the rate (in majority) and latitude
  - Each location
  - Uniform latitude binning

Latitude dependence (per location)

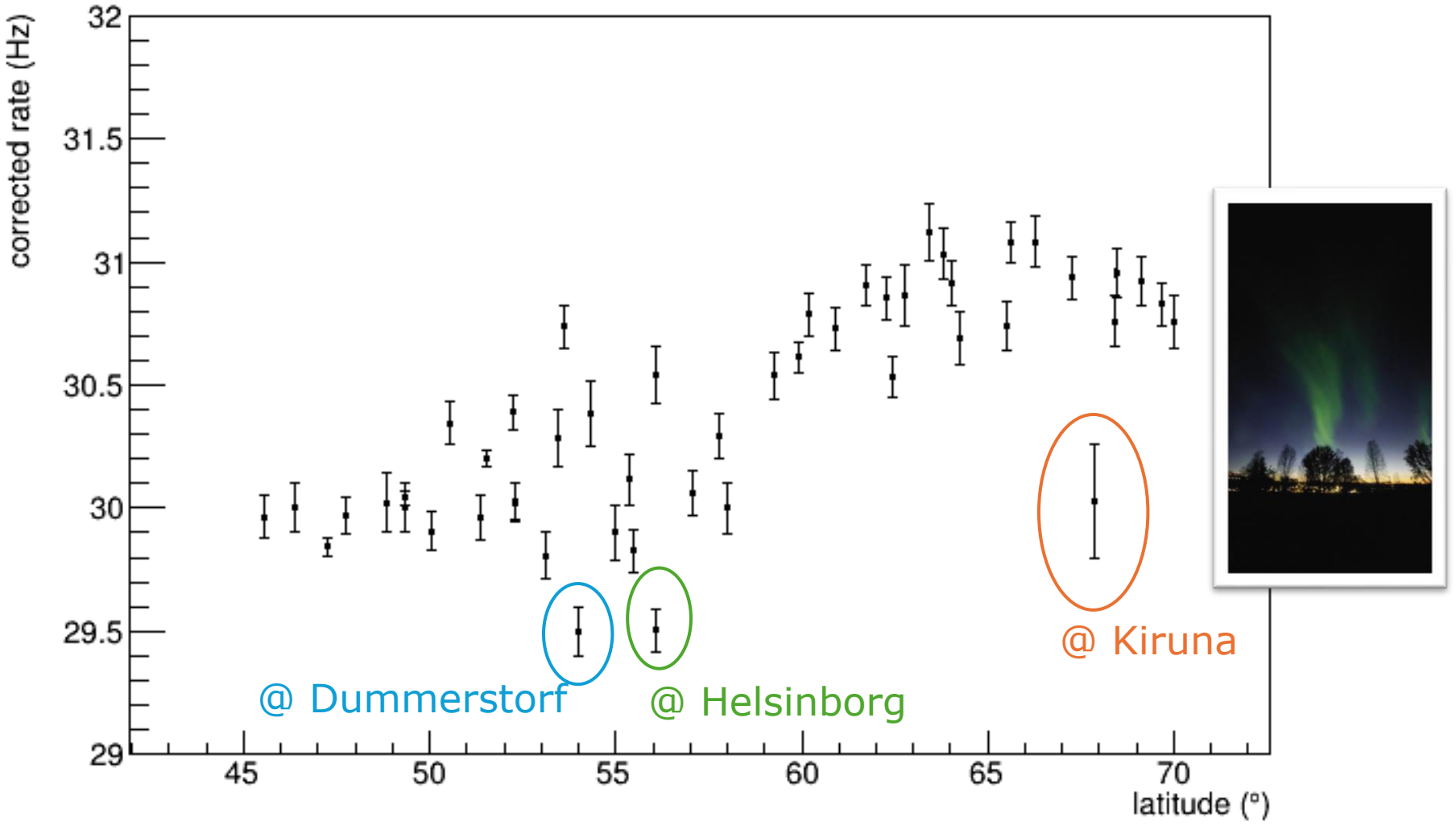




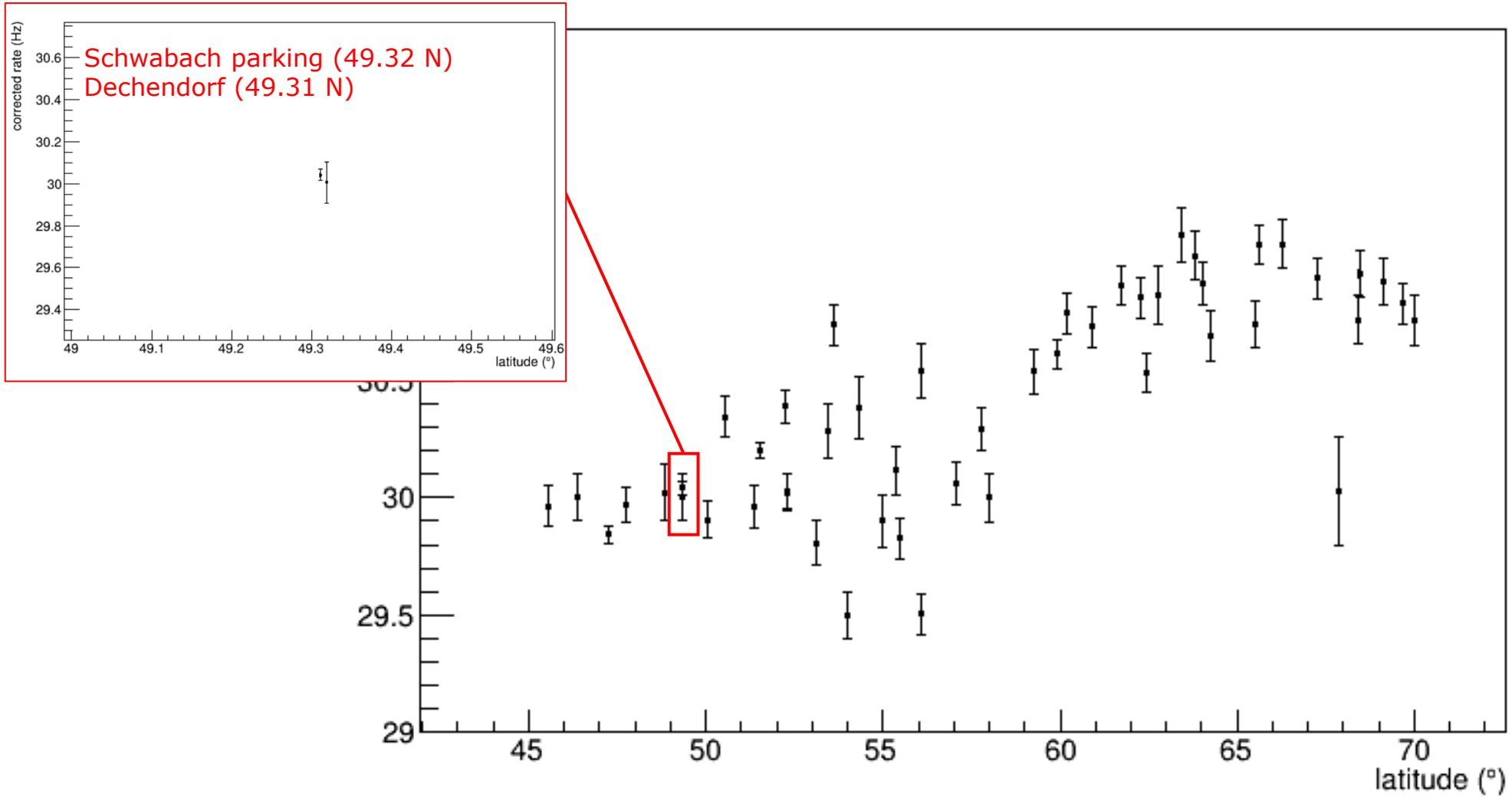
From the elog:
“Fixed inside the car in bologna”

→ Runs excluded from the analysis

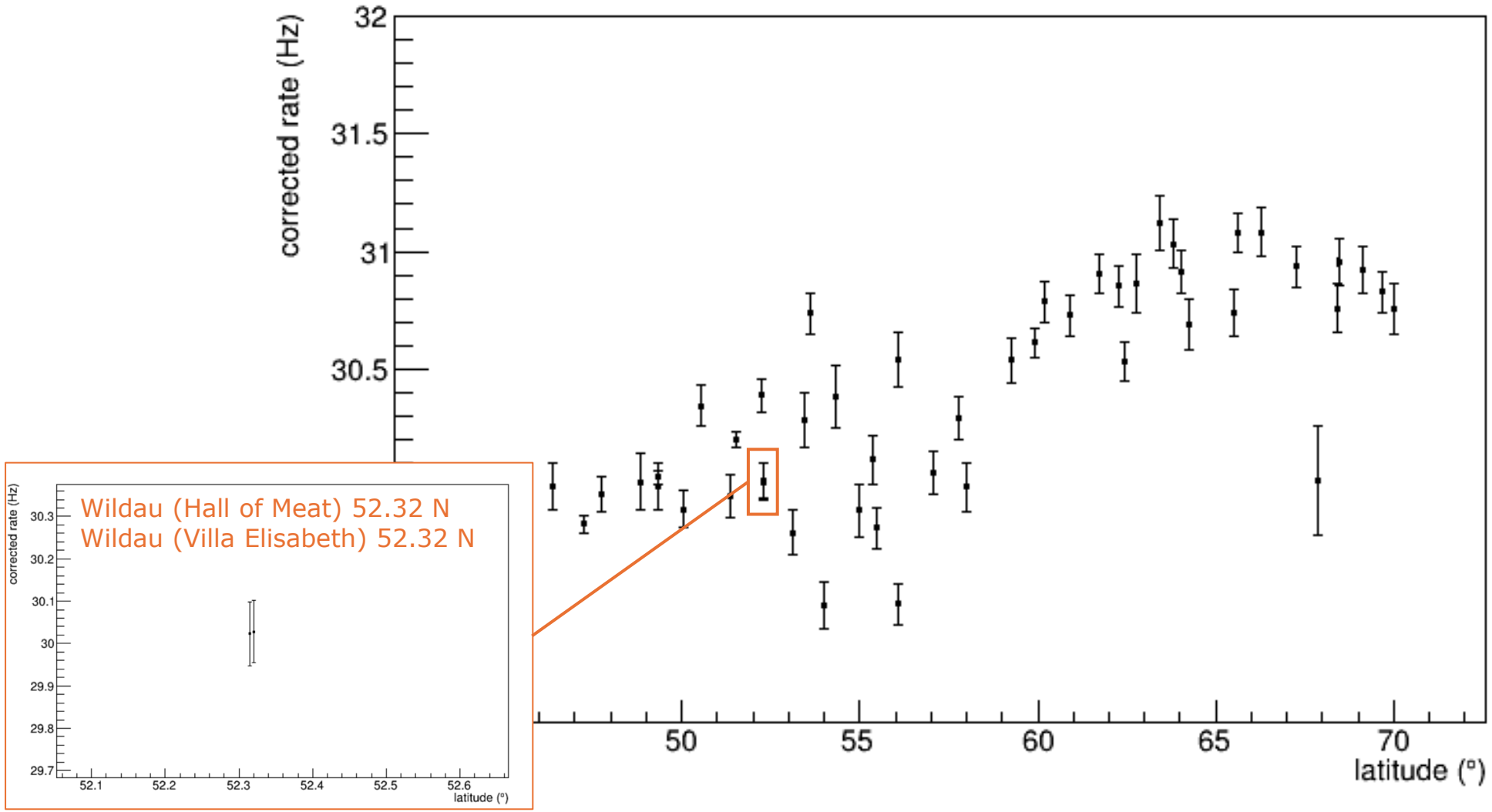
Latitude dependence (per location)



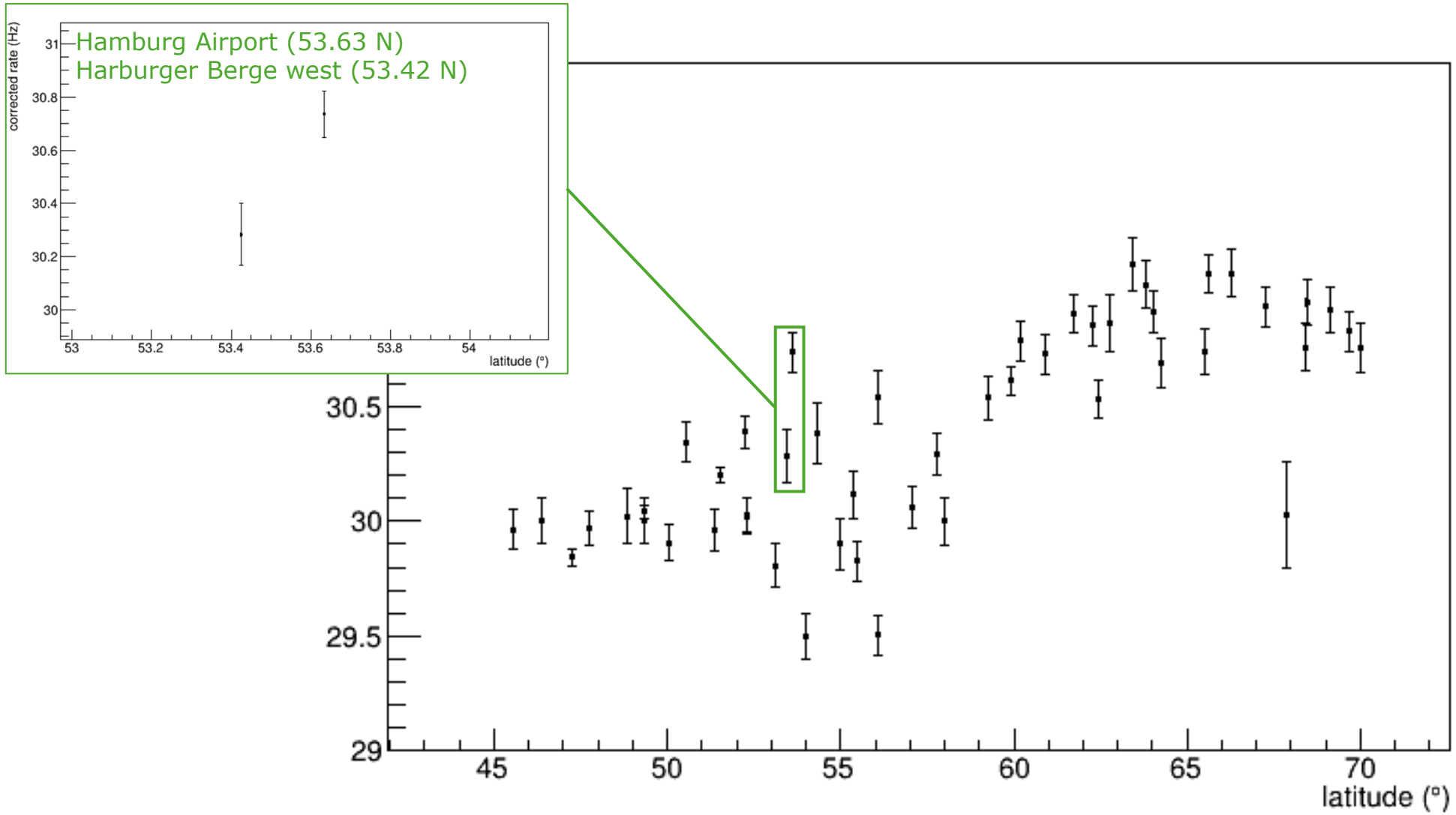
Latitude dependence (per location)



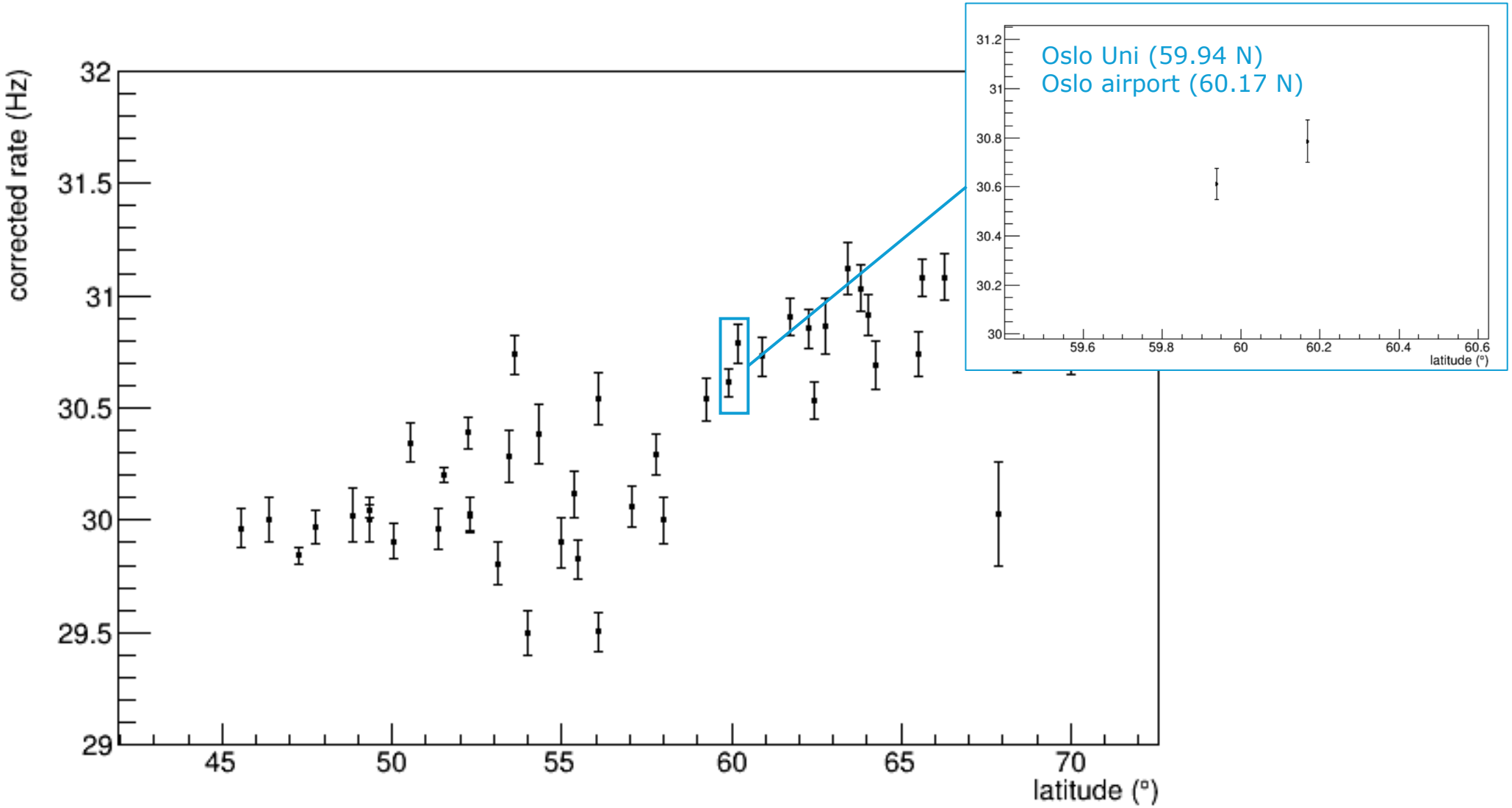
Latitude dependence (per location)



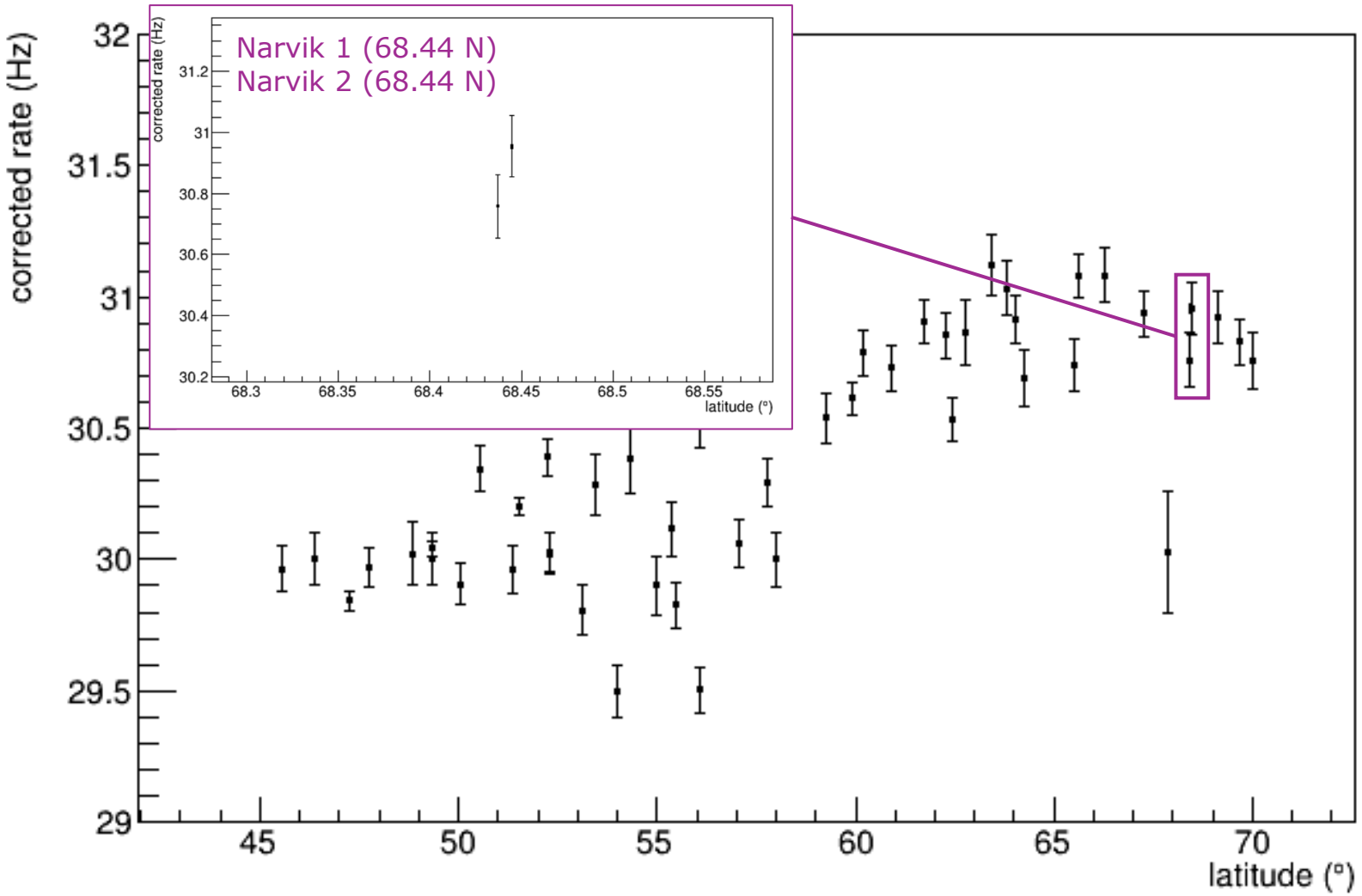
Latitude dependence (per location)



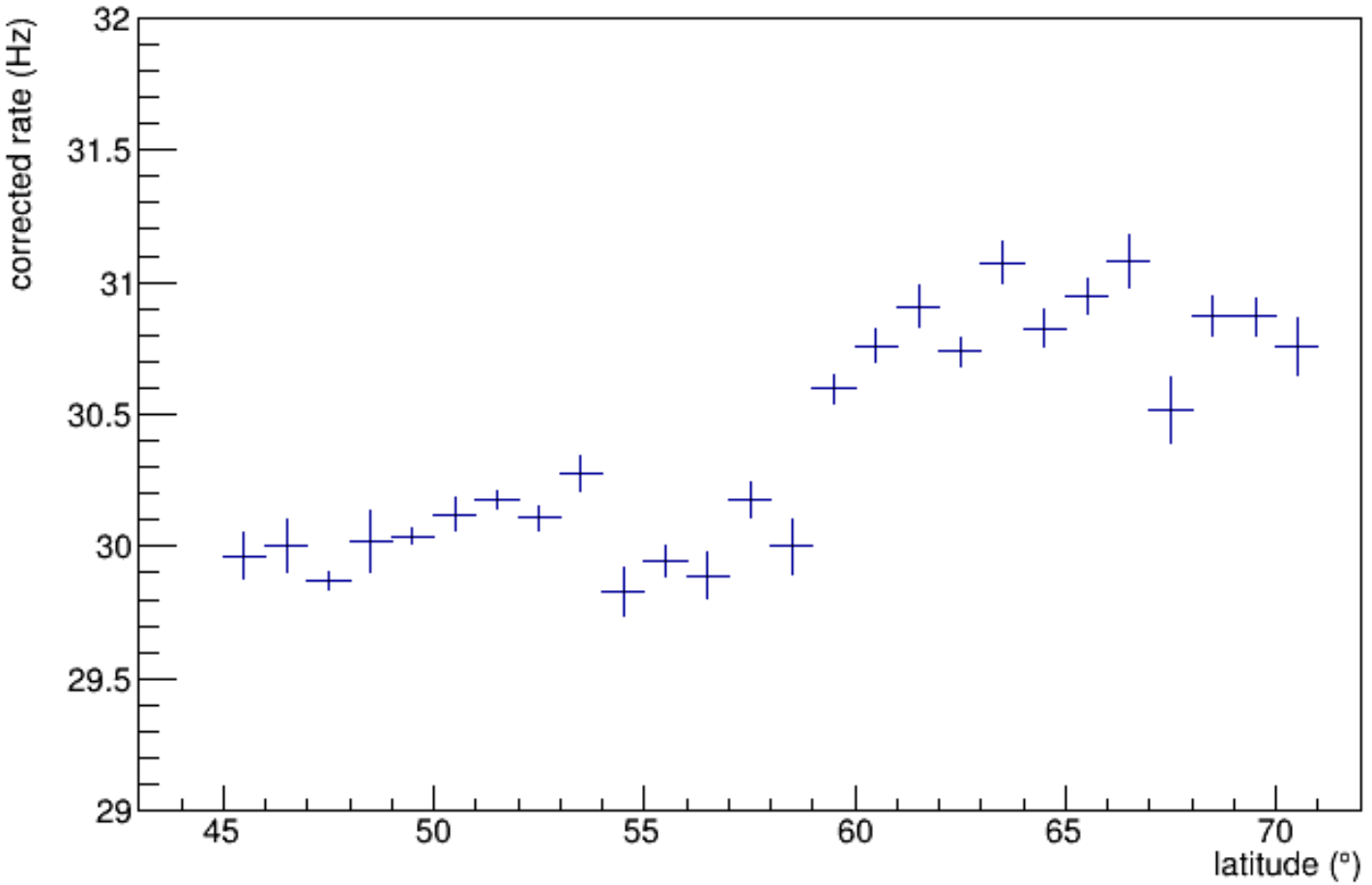
Latitude dependence (per location)



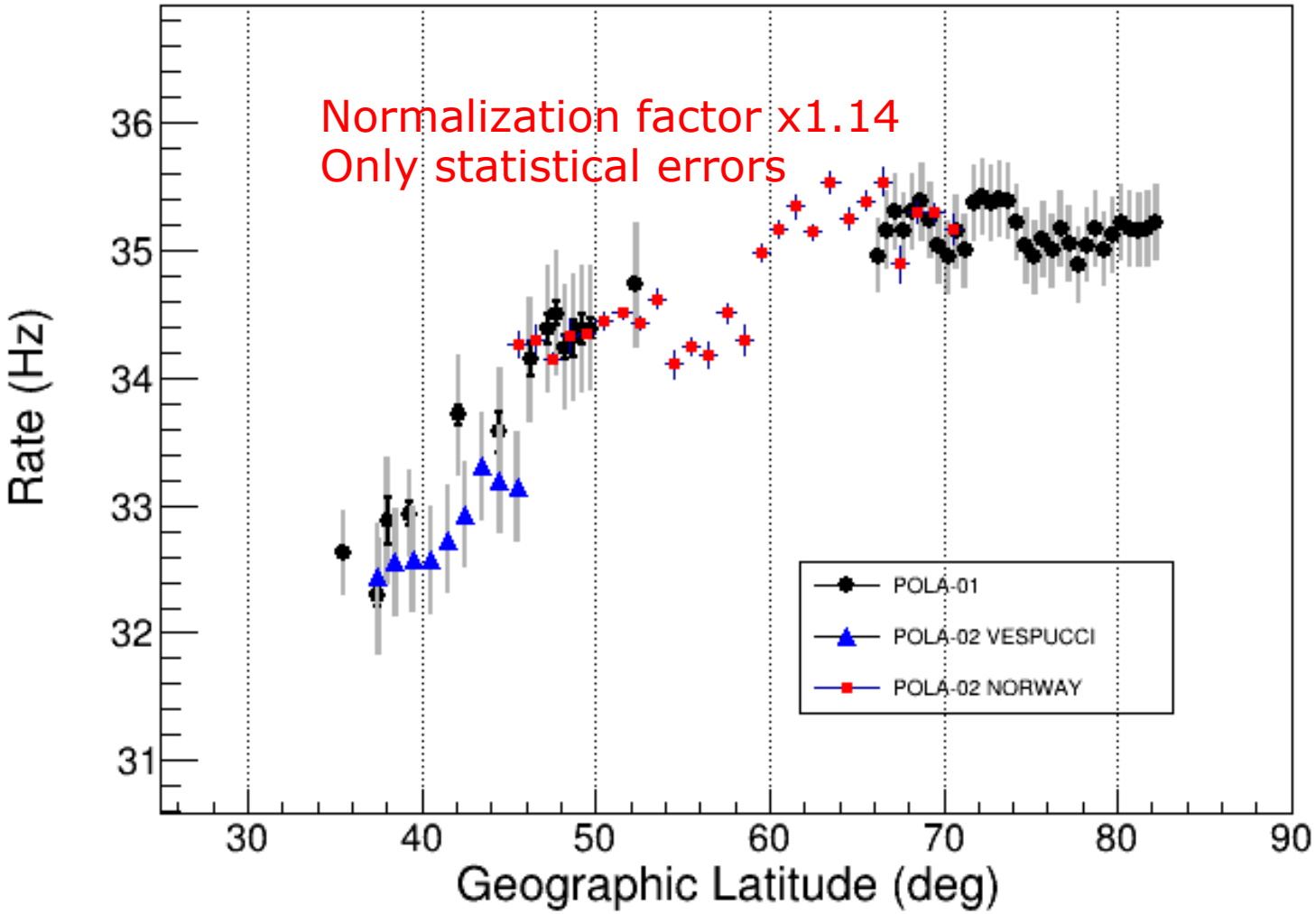
Latitude dependence (per location)



Latitude dependence (uniform lat binning)



Preliminary comparison



Back-up slides

Before barometric correction