

Stato dei telescopi POLA a Ny Ålesund Dati raccolti e prospettive

aggiornato al 16 febbraio 2023

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Stato dei tre detector: POLA-1

- Installed in the CCT cabin
- Requires reboot or manual restart of the gpsd service, from time to time (last: 8/2/2023, 13/2/2023)
- BNO055 not working



Stato dei tre detector: POLA-3

- Installed in the Dirigibile Italia base
- Working fine
- Sometimes offline if guests need network outlets in the lab
- Last reboot-restart for GPS 19/8/2022




Stato dei tre detector: POLA-4

- Installed in the Gruvebadet laboratory
- SenseHat not working since 19/8/2022
- Offline most of the time, due to a network problem in the lab, not solved and not understood yet by Kings' bay (noticed on 19/8/2022)



Stato dei sensori dei POLA

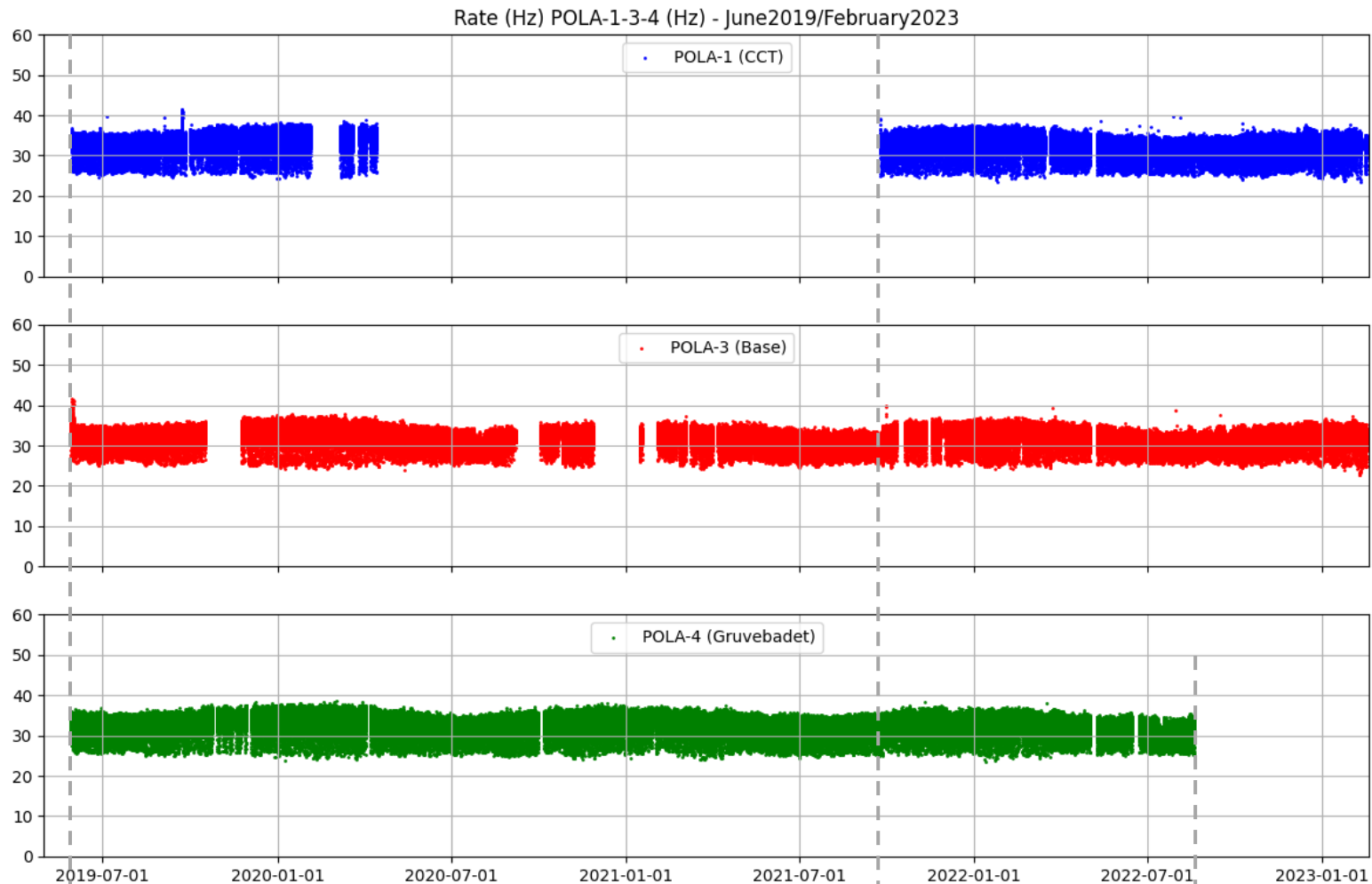
Detector	GPS GNSS- Ublox	SenseHat (gyro,mgn, accel,temp, pres,humi)	BNO055 absolute orientation	BME280 press, temp humi	DS18B20 (onewire) temp
POLA-01		✓	✗	✓	✓
POLA-02					
POLA-03		✓	-	✓	✓
POLA-04		✗	-	✓	✓

Intervention foreseen in Ny Alesund 30 May-5 June 2023

- Substitute the faulty SenseHat on POLA-4
- Fix the readout procedure once the sensor is back
- Investigate the GPS failures on all POLA (especially POLA-1)
- Clarify the situation at Gruvebadet, about the dismantling of the lab
- Investigate the network issues in Gruvebadet, together with King's Bay
- General review of installations, inventory, tools etc.

Disponibilità dei dati dal 2019 a oggi

All rates corrected for pressure – in all slides



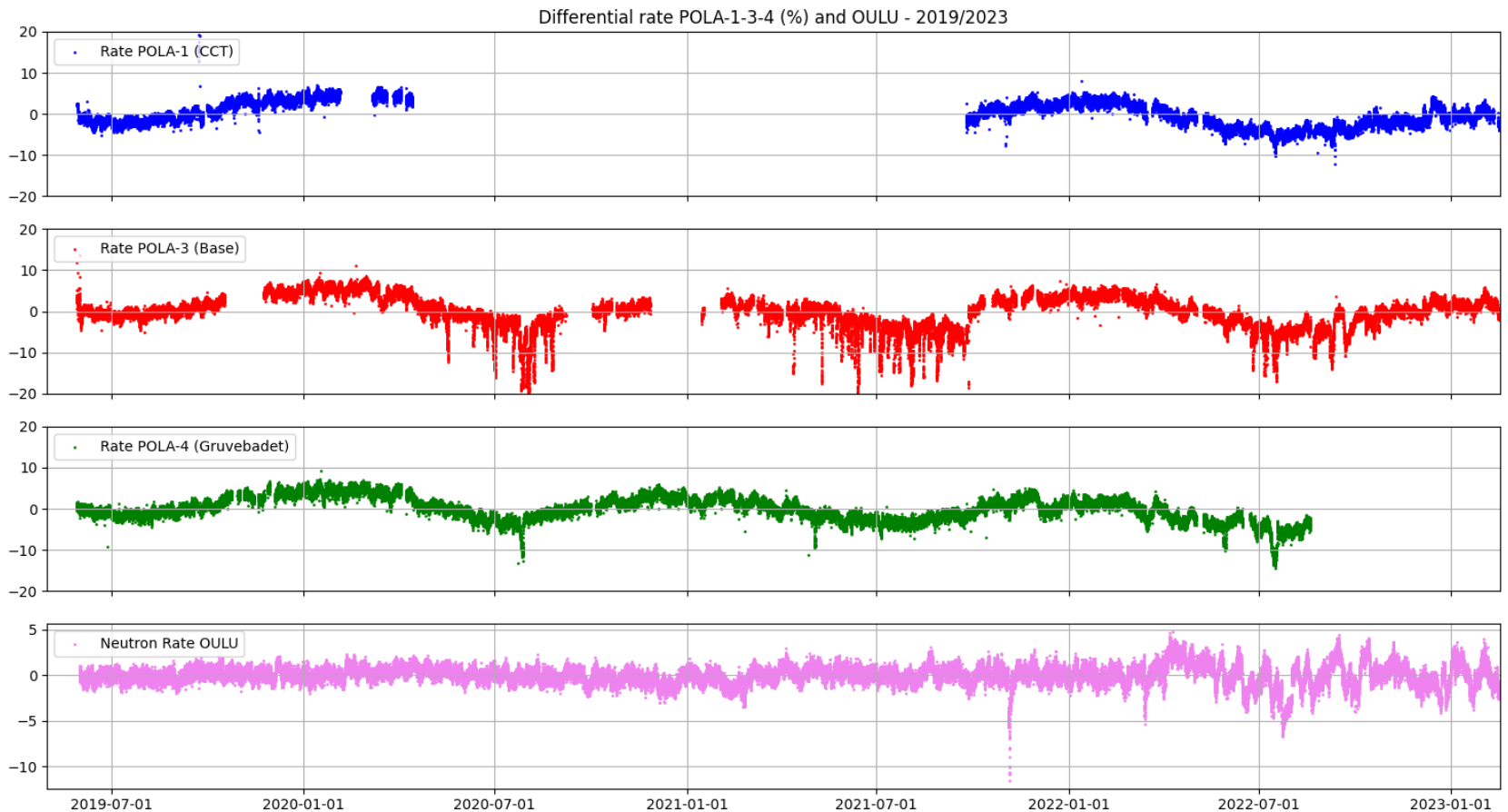
installation at NyA
26-31 May 2019

Intervention to repair P1
23-26 September 2021

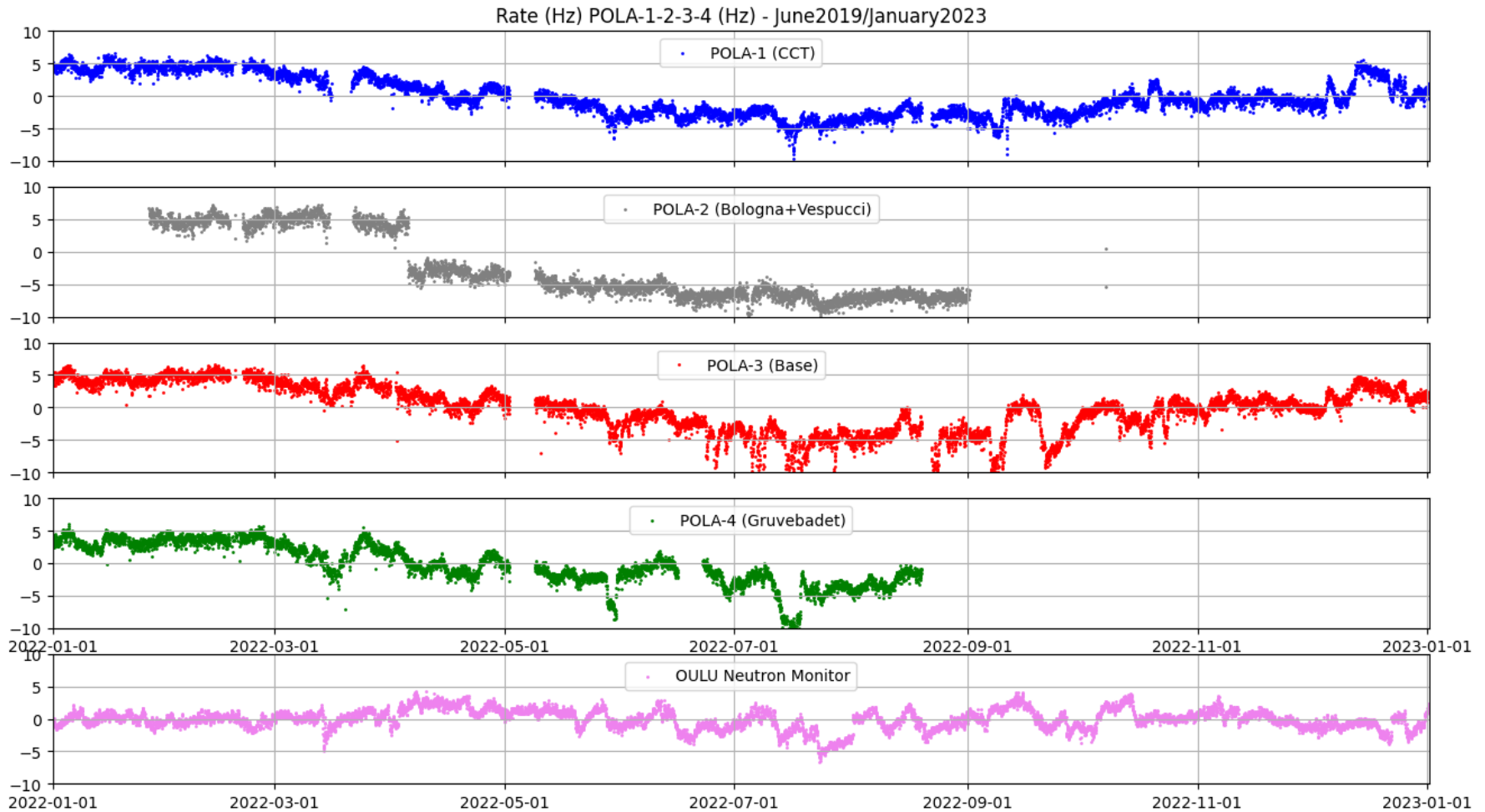
SenseHat not working
Data is available but must
be corrected for pressure
with alternative data

Differential rates 2019-2023

and comparison with OULU neutron monitor

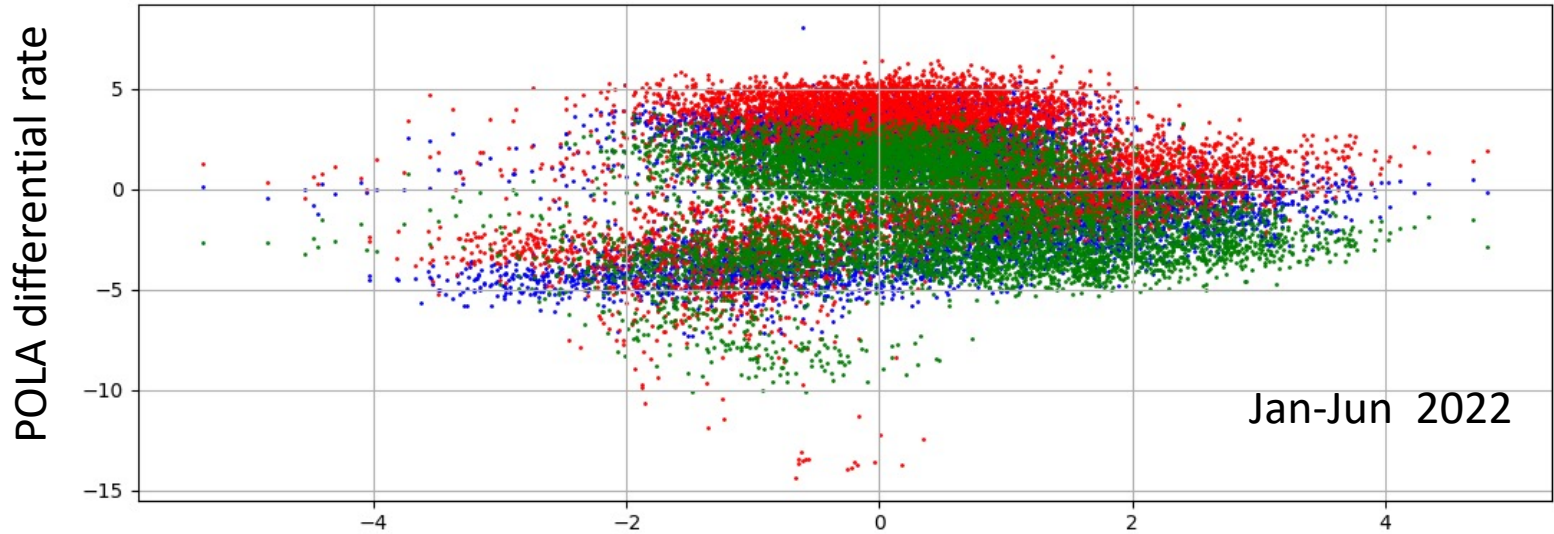


Differential rates in 2022

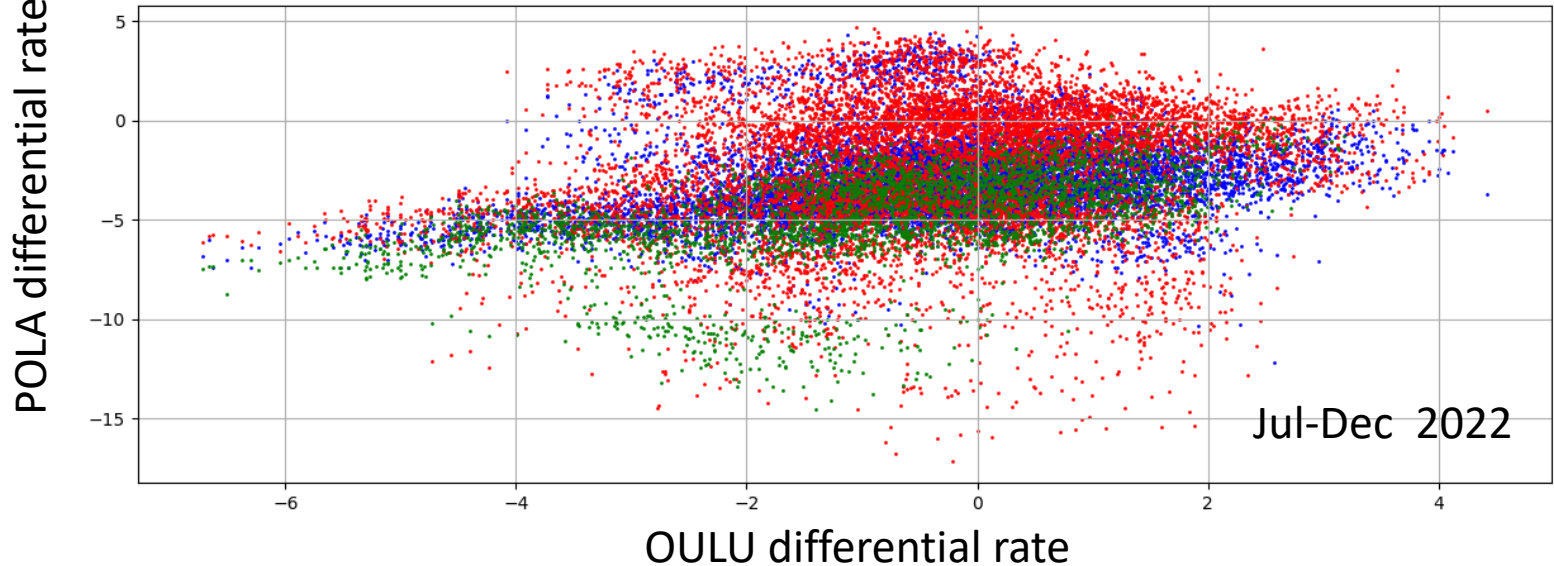


Correlation with OULU neutron rates

Correlation between differential POLA rates and differential OULU rate 2022a



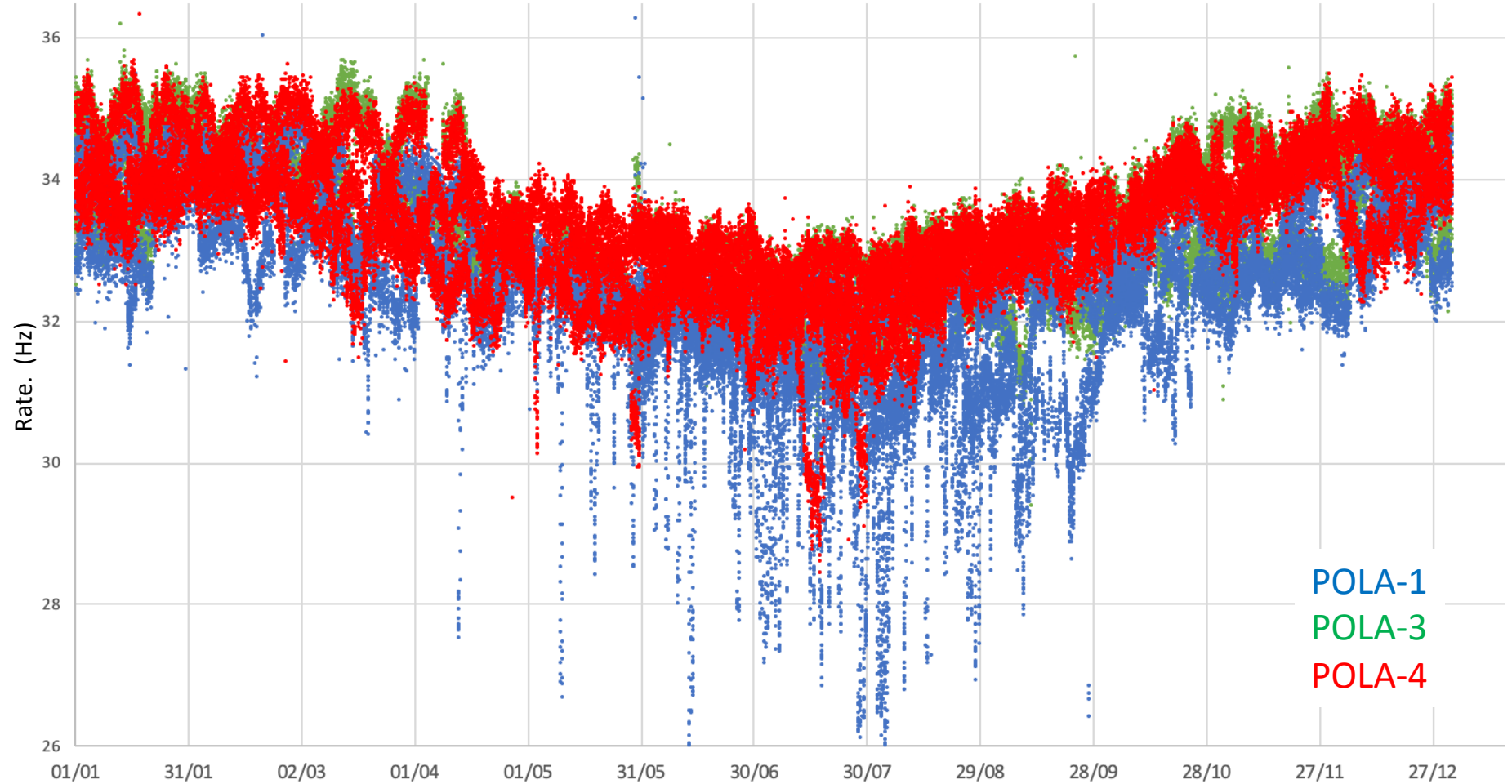
Correlation between differential POLA rates and differential OULU rate 2022b



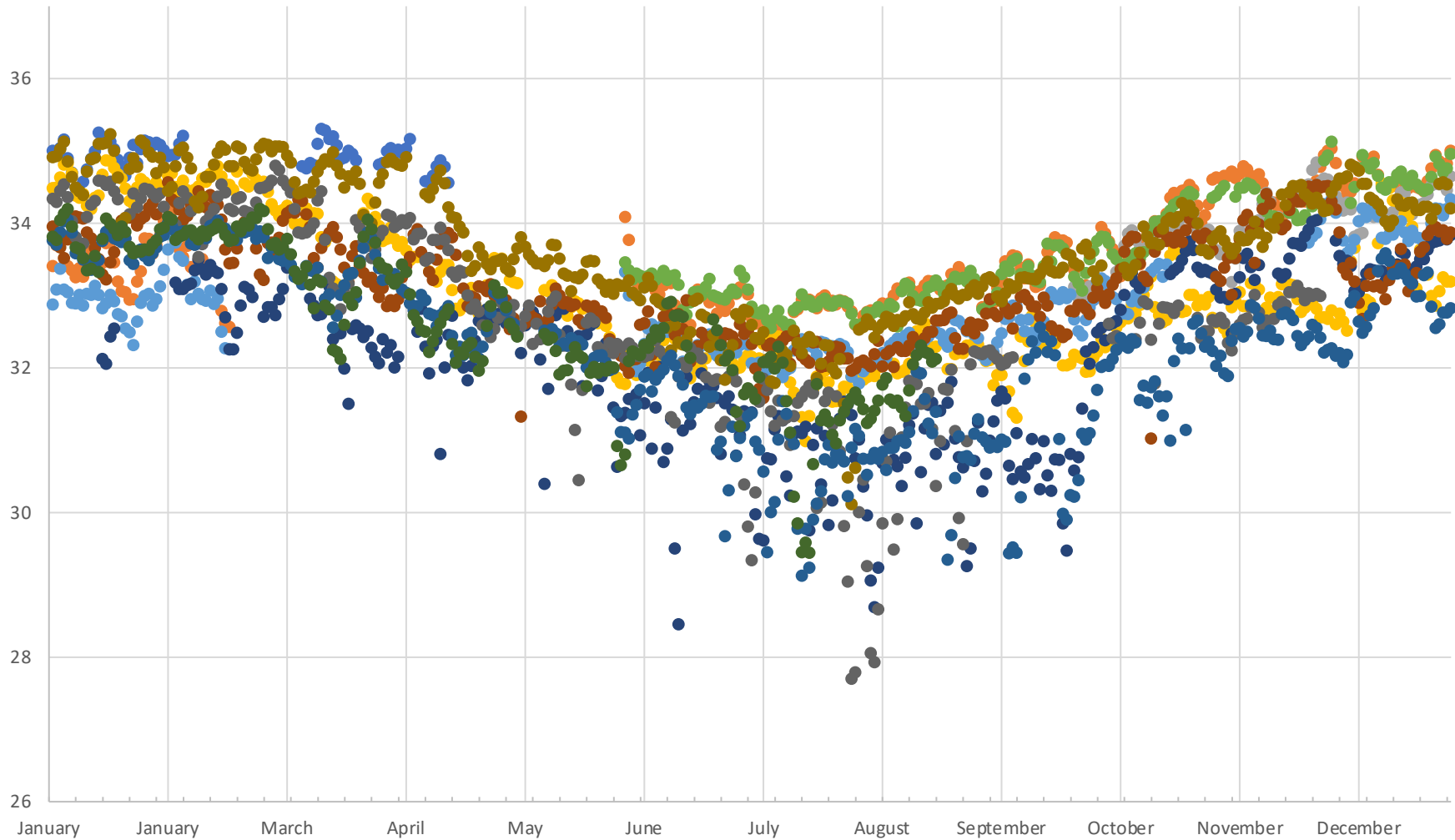
POLA-1
POLA-3
POLA-4

Seasonal variation of rates

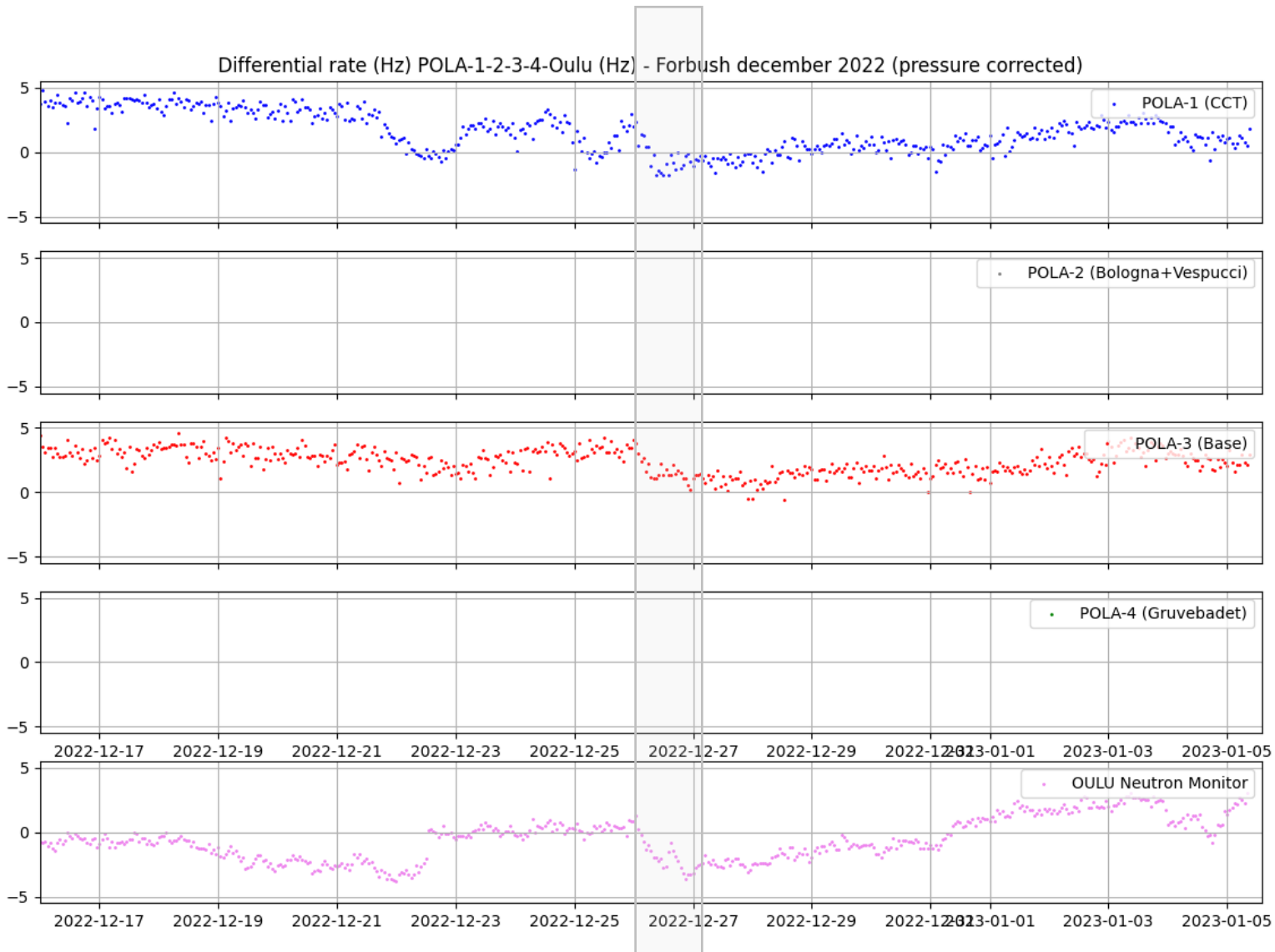
Seasonal trend



Seasonal trend – daily averages

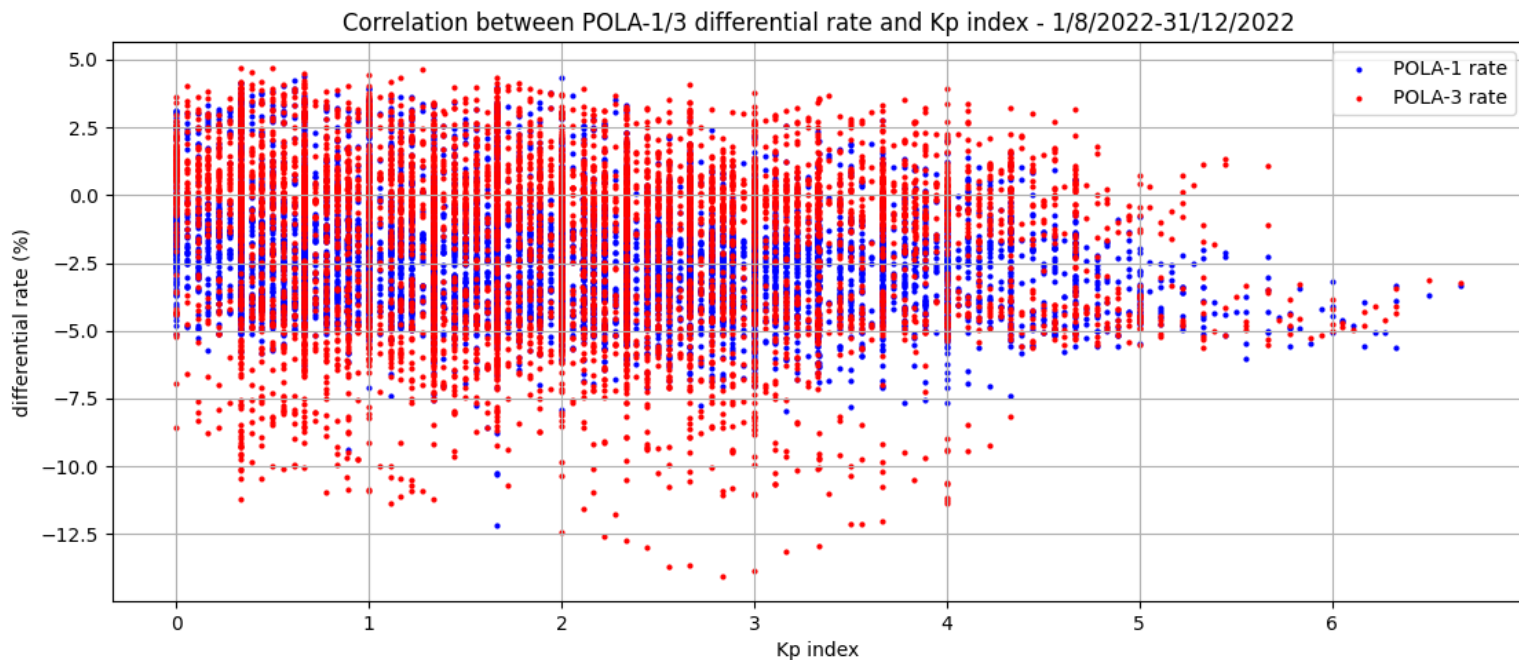


Forbush 26-12-2022



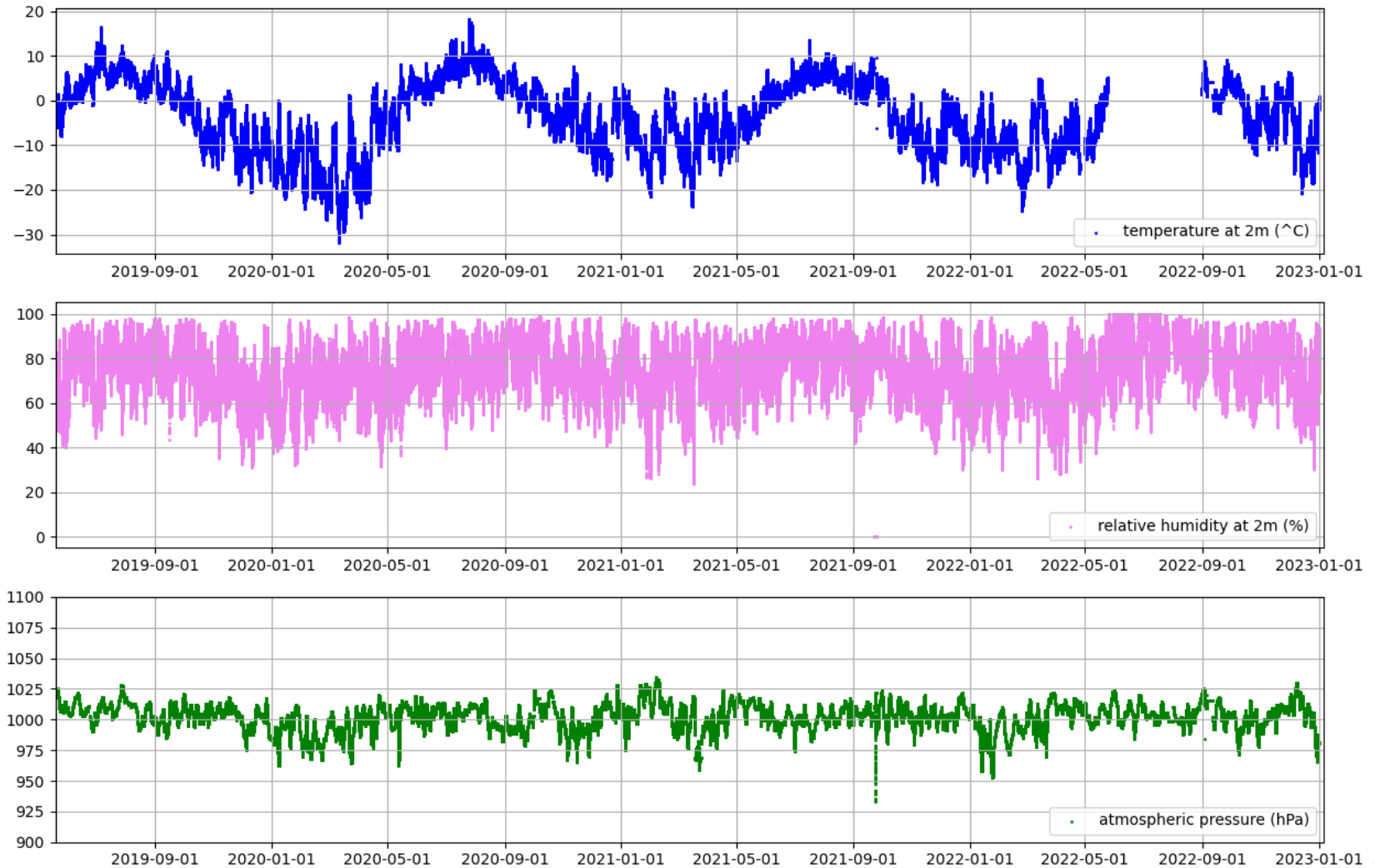
Kp index

- The Kp-index describes the disturbance of the Earth's magnetic field caused by the solar wind.
- Kp planetary index is the average of 13 labs around the world, $\text{aveg}(\text{max}, \text{min})$ computed every 3 hours



Dati meteo (CNR)

Meteo data from CNR



To do, prospettive per analisi con dati POLA

- Rigenerazione e correzione rate e analisi come serie temporali
- Applicazione di filtri e studio frequenze
- Correlazioni con indici di attività solare, campo magnetico terrestre ecc.
- Estrazione di altre variabili (diverse dai rate)
- Idee, suggerimenti?