# Analisi dati 2025 OverEEEland2025

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Fixed Data Analysis

RatePCorr VS Latitude

- Barometric correction using a reference atmosferic pressure of 1014 mbar and a barometric coefficent of 0.23%/mbar

- Calculation of the average latitude and the pressure corrected rate on given run intervals

- Calculation of the error on the pressure corrected rate using the formula $\sigma_{\bar{x}} = \sigma_x / \sqrt{n}$,

Latitude VS Data
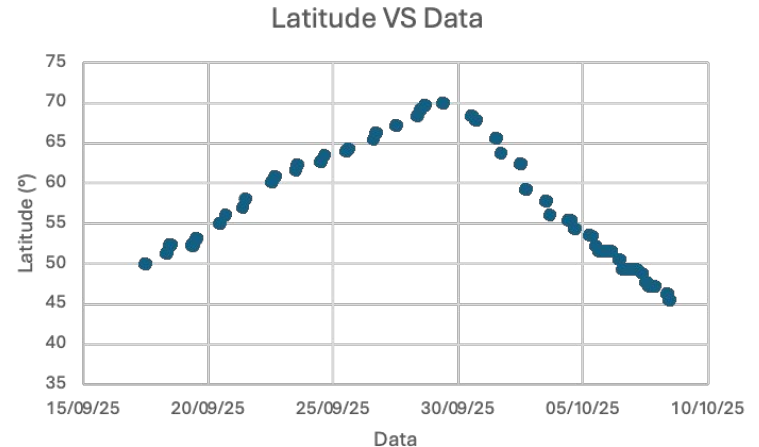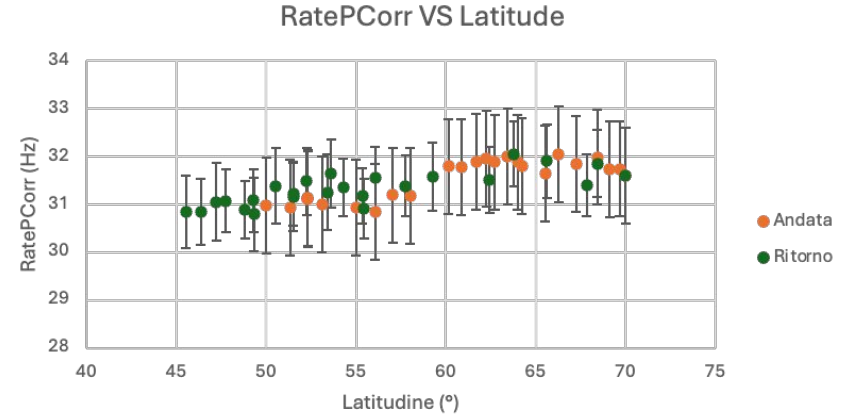
Fixed Data Normalization

The data have been normalized both with respect to the fit of the data from the previous 2018 campaign and with respect to the fit of the 2025 data. It was observed that the 2018 ratio is less than one, which indicates a decrease in the rate that could be due to solar activity or variations of the Earth's magnetic field and atmosphere.

Rate $y = 4E\text{-}05x^3 - 0,0099x^2 + 0,7641x + 15,764$

Normalization fit 2018	Normalization fit 2025
0,90	1,034551757
0,90	1,034208345
0,90	1,040715285
0,90	1,041551236
0,90	1,041551236
0,89	1,037334377
0,89	1,035552321
0,89	1,032880346
0,89	1,044620414
0,89	1,044609331
0,91	1,06659535
0,91	1,067136065
0,91	1,071941471
0,91	1,074878
0,91	1,073406758
0,91	1,079105519

RatePCorr VS Latitude
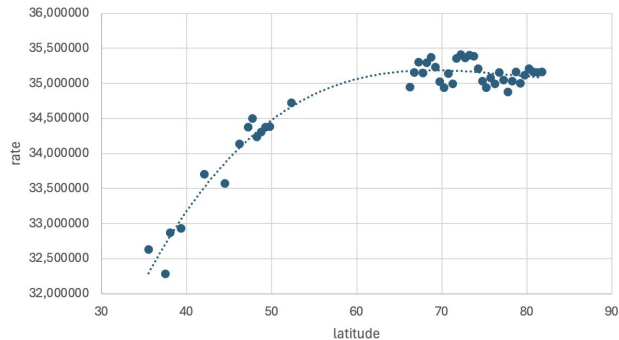
$y = -0,0003x^3 + 0,0497x^2 - 2,7485x + 80,687$
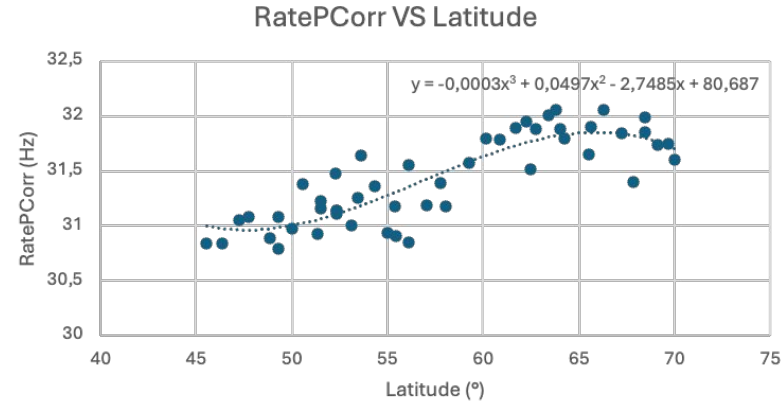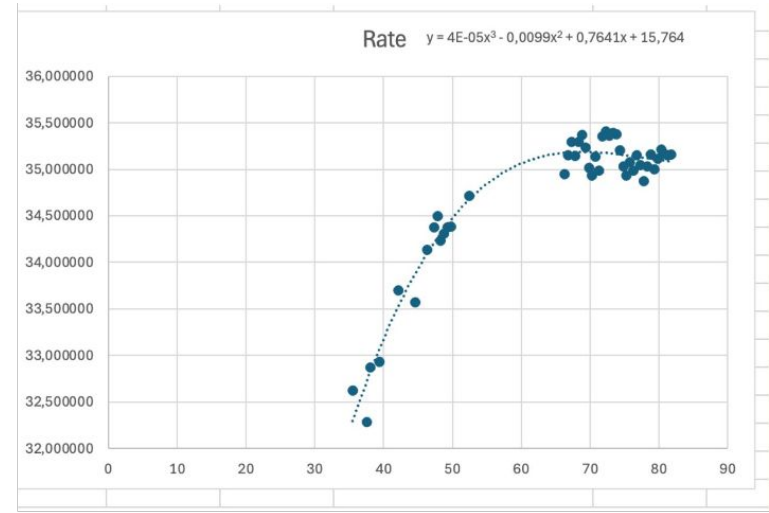
MOVING DATA

in the graph at the side the latitude as a function of the date made us distinguish the outward journey from the return journey
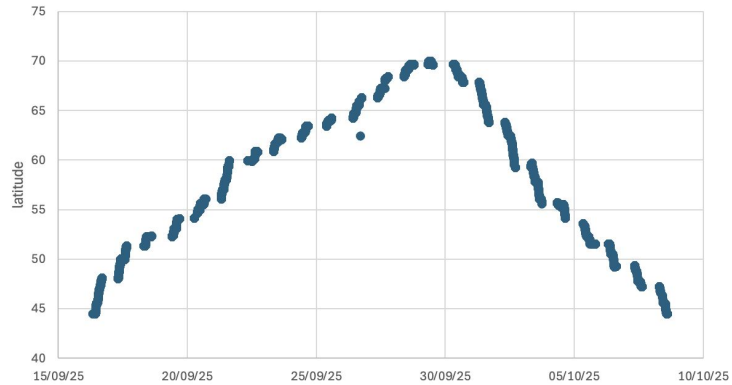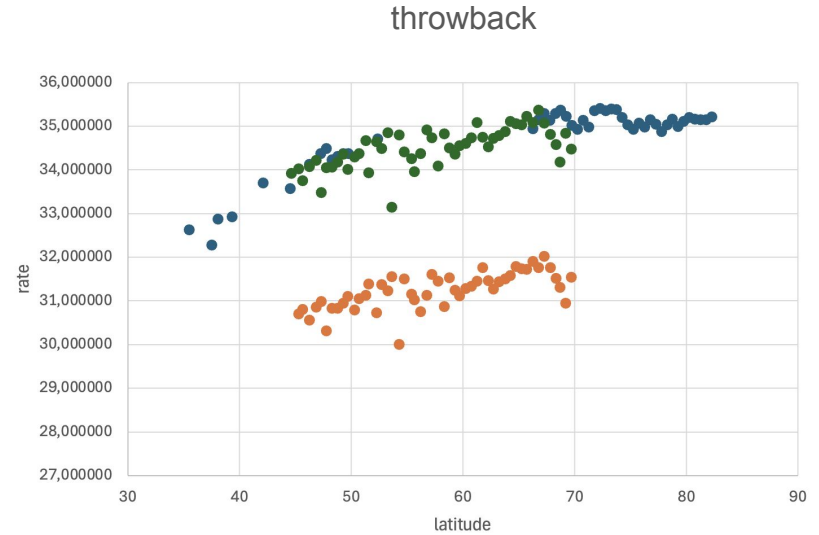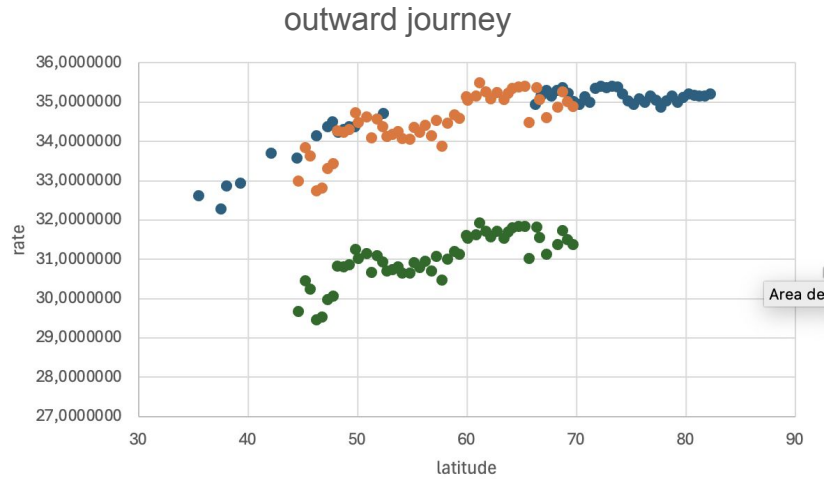

$$y = 4E\text{-}05x^3 - 0{,}0099x^2 + 0{,}7641x + 15{,}764$$

This plot represents the rate as a function of latitude of in datasets taken in 2018 in one of the polarquEEEst; from here we took the trend line graph (third degree polynomial fit) to obtain the ratio
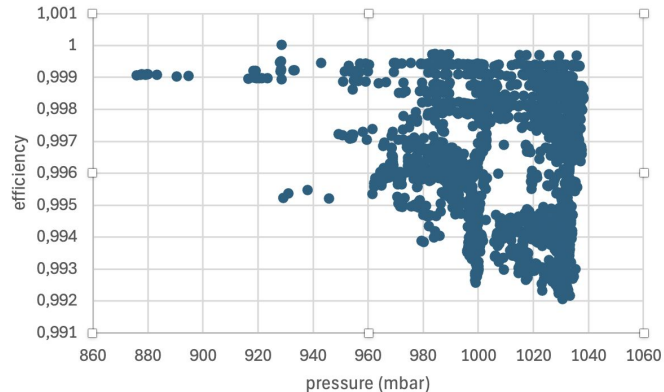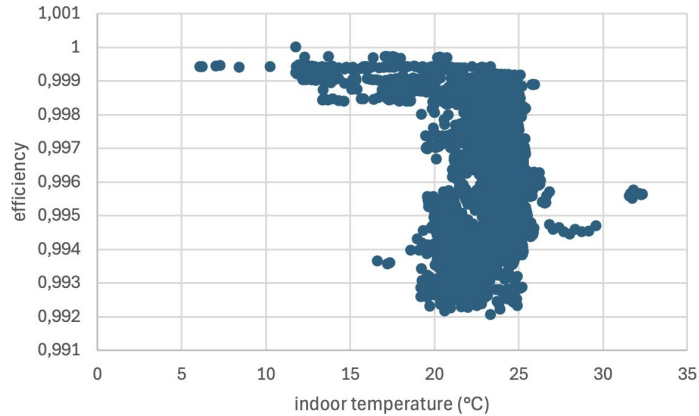
MOVING DATA

outward journey

throwback

green= corrected rate by the barometric coefficient / orange =normalised rate / blue= rate from the 2018 data

multiplying the corrected rate by the barometric coefficient by the mean of the ratio we obtain the normalised rate which can be compared with the rate of the data collected in 2018

FOCUS ON SPECIFIC RUNS

We calculated the efficiency by dividing the rate by corrected rate by the barometric coefficient. By doing this, we obtained very stable values close to 1.

We studied the dependence of efficiency on other parameters (indoor temperature and pressure). These graphs demonstrate the extreme sensitivity of the detectors, especially with respect to the internal temperature