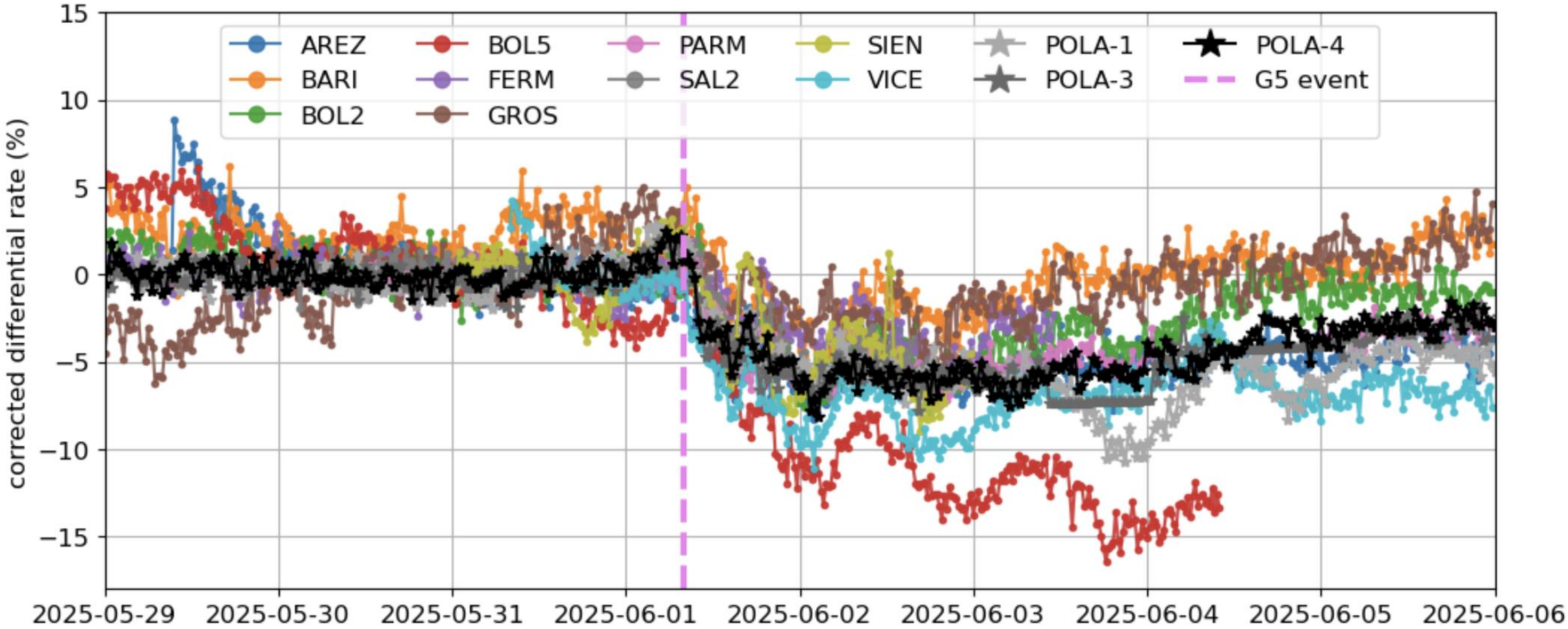
# Proposta Masterclass

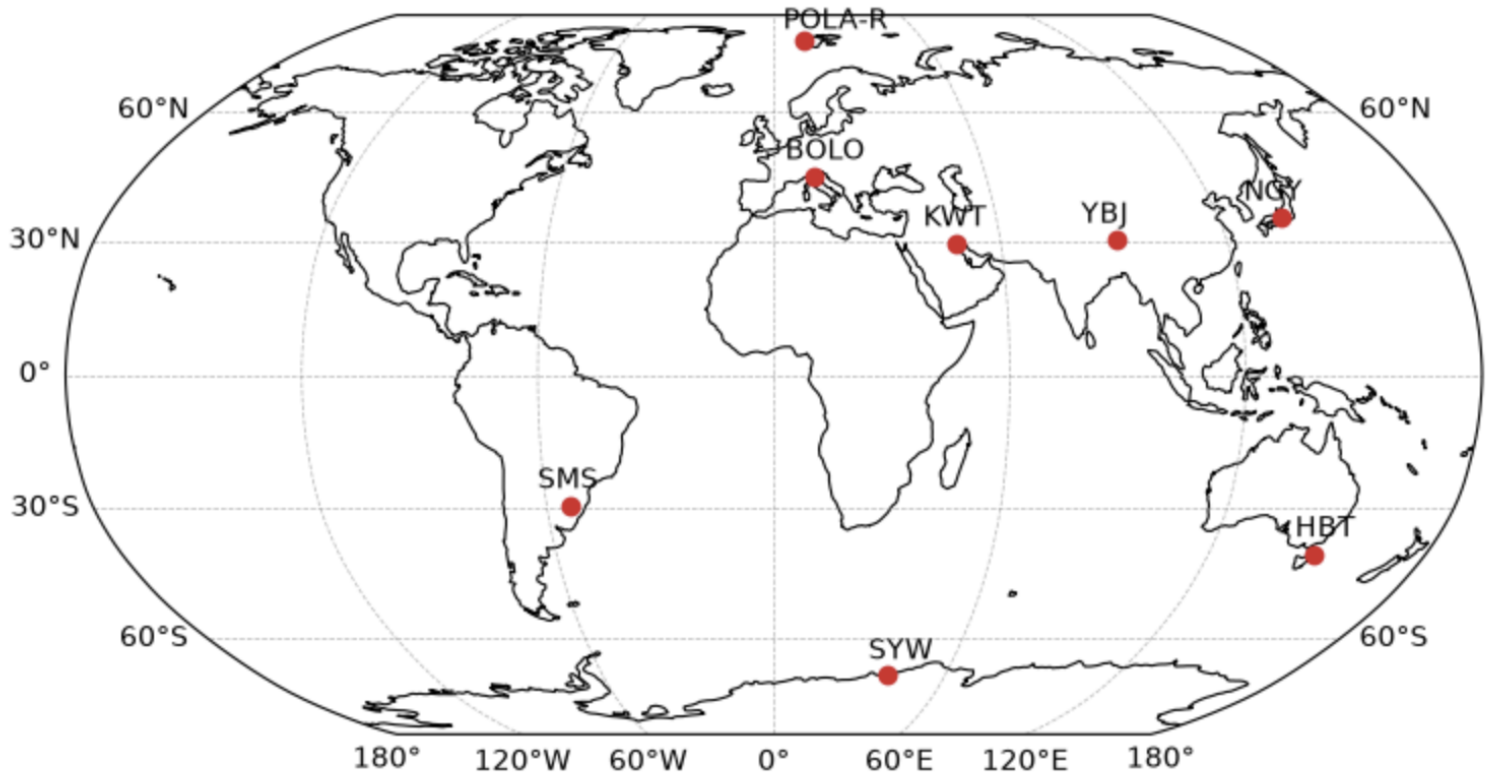
Francesco Noferini e Ombretta Pinazza

# Forbush Decrease 1/6/2025

avevamo già analizzato questo evento con EEE e POLA-R

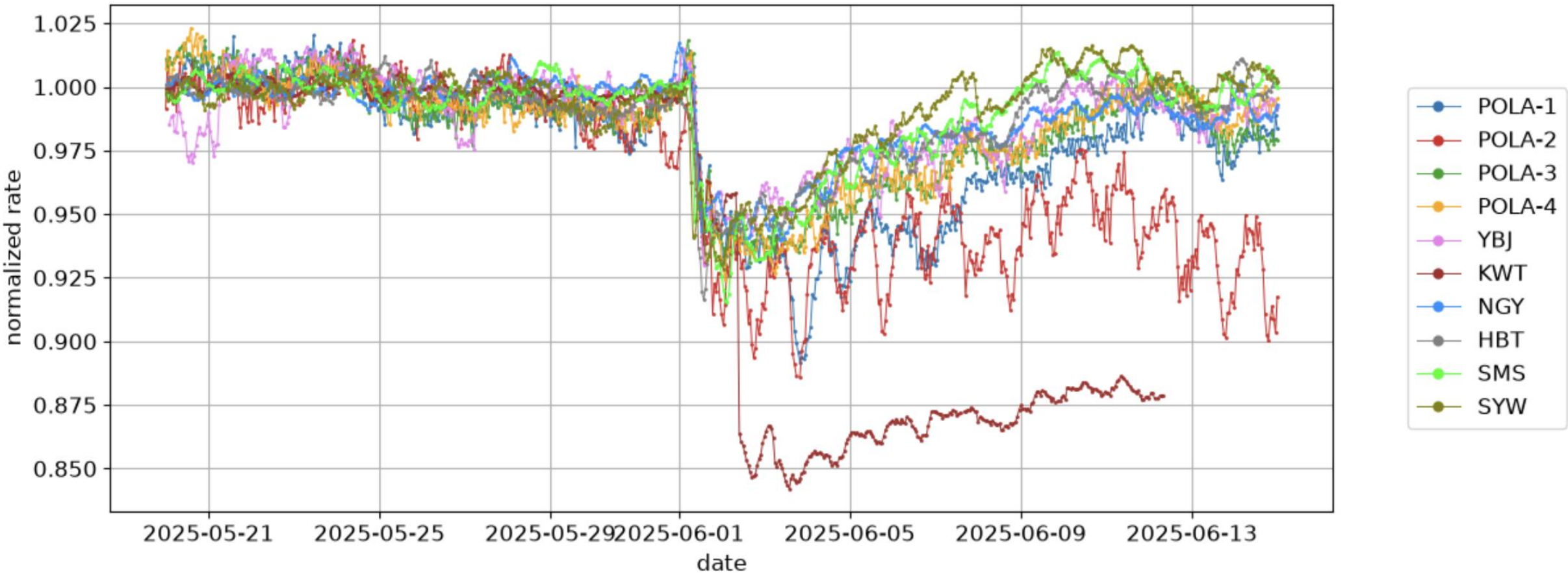


# Osservare lo stesso evento FD da diversi siti nel mondo

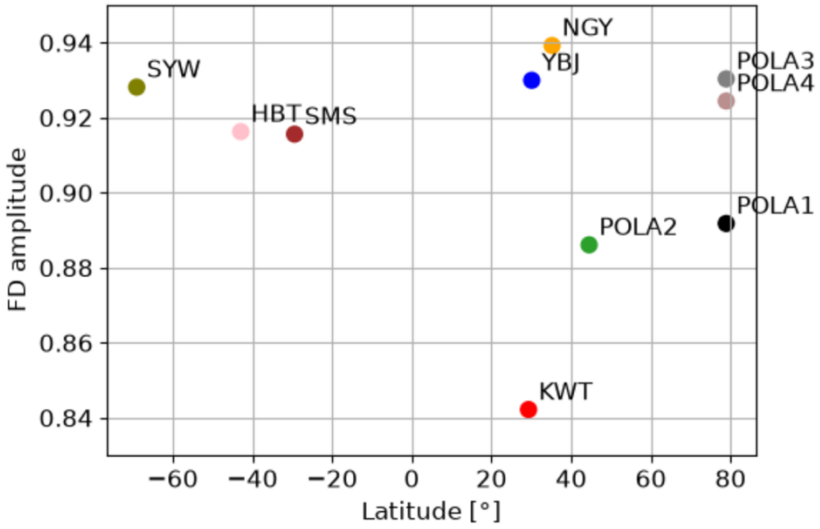


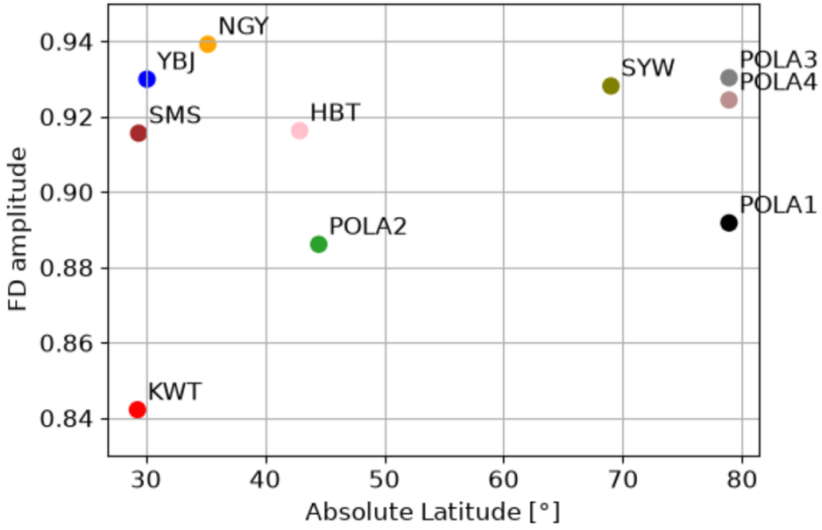

| | ratePOLA1 | ratePOLA3 | ratePOLA4 | ratePOLA2 | rateYBJ | rateKWT | rateNGY | rateHBT | rateSMS | rateSYW |
|---|---|---|---|---|---|---|---|---|---|---|
| 2025-05-20 00:00:00+00:00 | 32.071 | 31.363 | 32.282 | 23.570 | | 2237955 | 2855219 | 1443161 | 2177669 | 507087 |
| 2025-05-20 01:00:00+00:00 | 32.092 | 31.244 | 32.522 | 24.011 | | 2235522 | 2857658 | 1443221 | 2173558 | 505409 |
| 2025-05-20 02:00:00+00:00 | 32.162 | 31.391 | 32.361 | 23.847 | 10711.800 | 2237921 | 2854924 | 1447733 | 2171534 | 505719 |
| 2025-05-20 03:00:00+00:00 | 32.195 | 31.311 | 32.051 | 23.699 | 10741.233 | 2239101 | 2856819 | 1447926 | 2172494 | 507012 |
| 2025-05-20 04:00:00+00:00 | 32.122 | 31.325 | 32.284 | 23.615 | 10748.933 | 2239164 | 2861527 | 1447567 | 2169132 | 506267 |

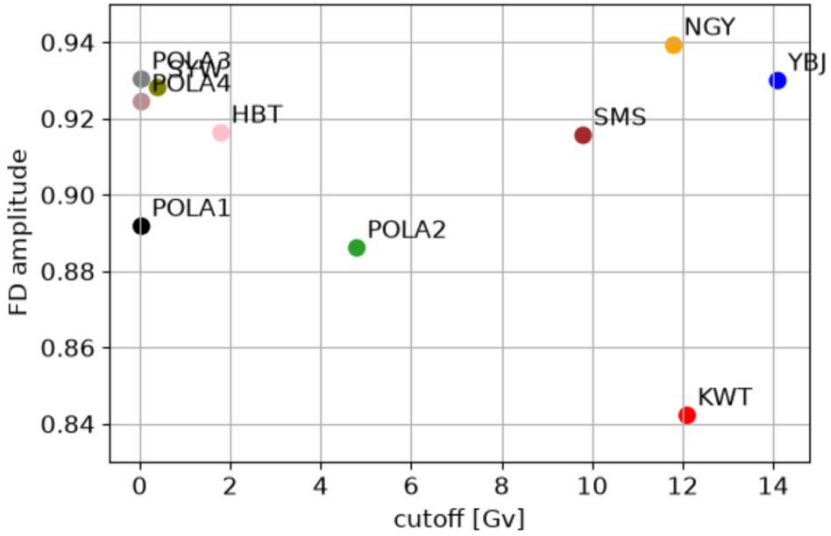
# Forbush Decrease del 1/6/2025



# Distribuzione geografica



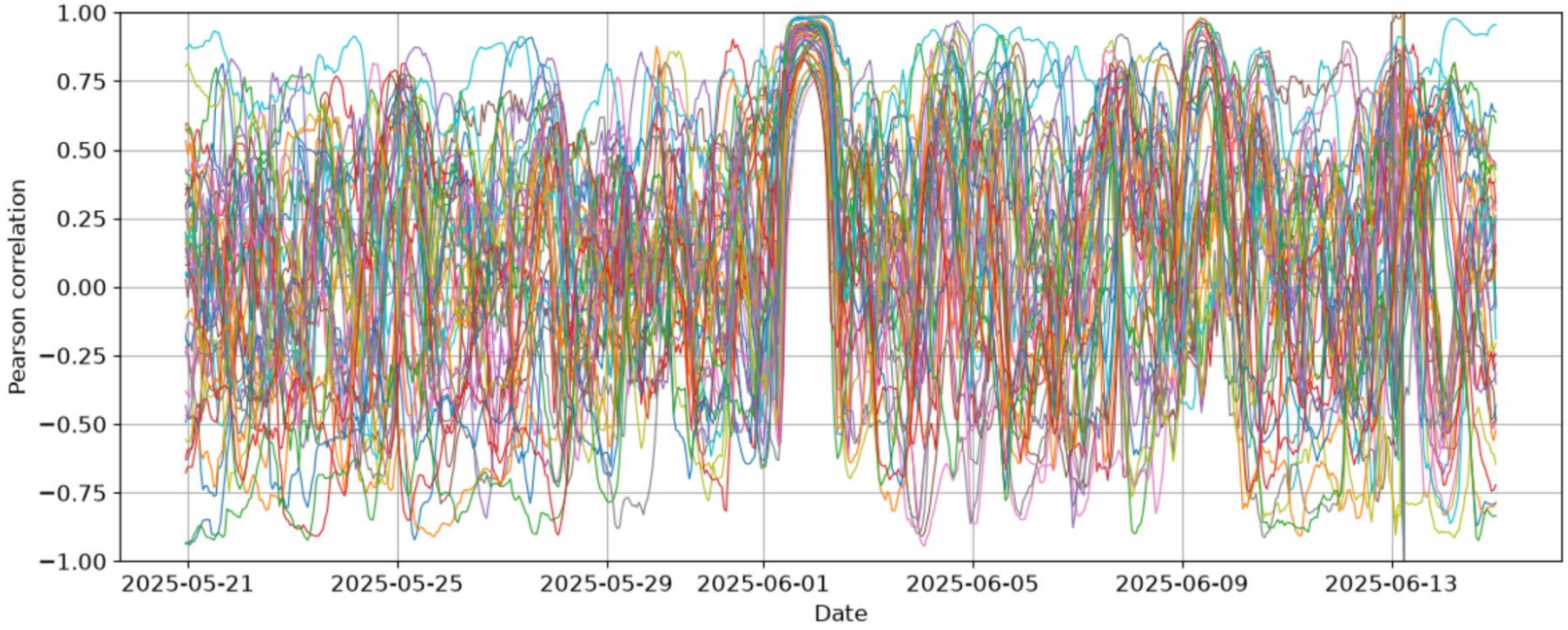

L’ampiezza del FD non mostra alcuna dipendenza geografica

# Calcolare il coefficiente di correlazione di Pearson

$$r = \frac{\mathrm{Cov}(X,Y)}{\sigma_X \sigma_Y} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

**Excel**: =CORREL(X; Y)

Evoluzione temporale della correlazione (finestra mobile di 24 ore)



# Appendice.

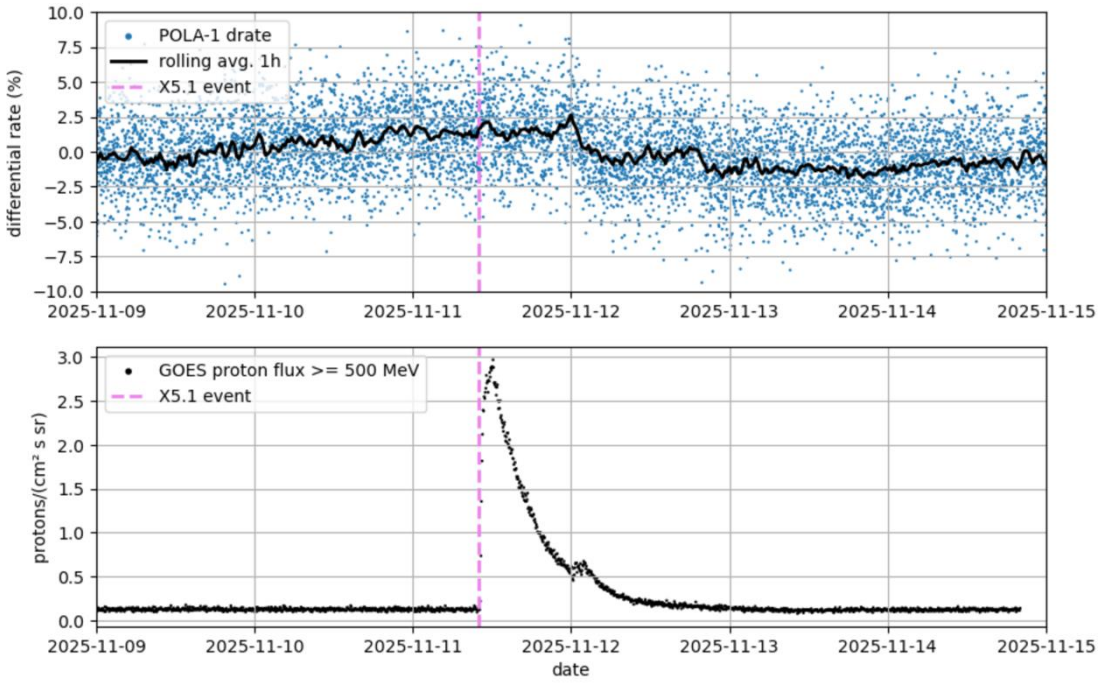
Possiamo utilizzare la correlazione mobile per riconoscere un possibile FD?

# Proviamo su un periodo diverso

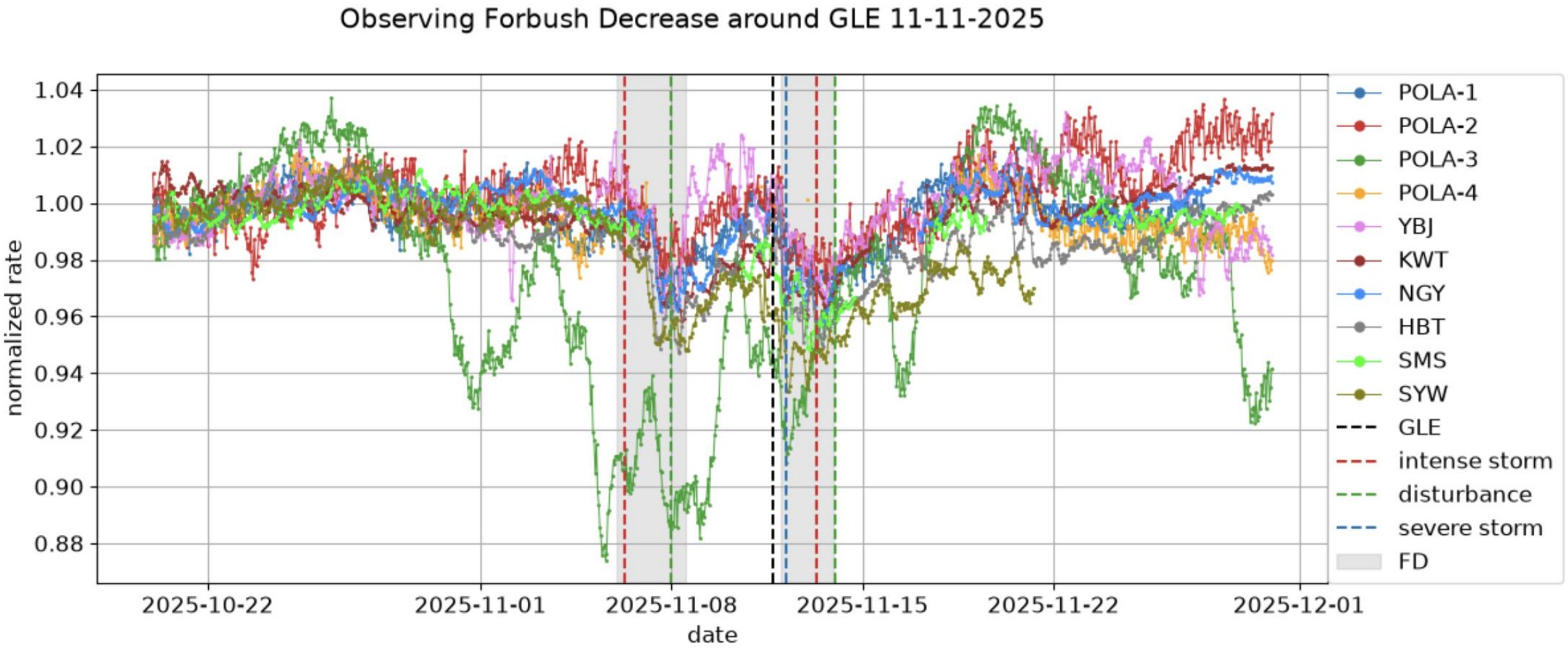
# 11/11/2025 : GLE#77

**Most intense events**

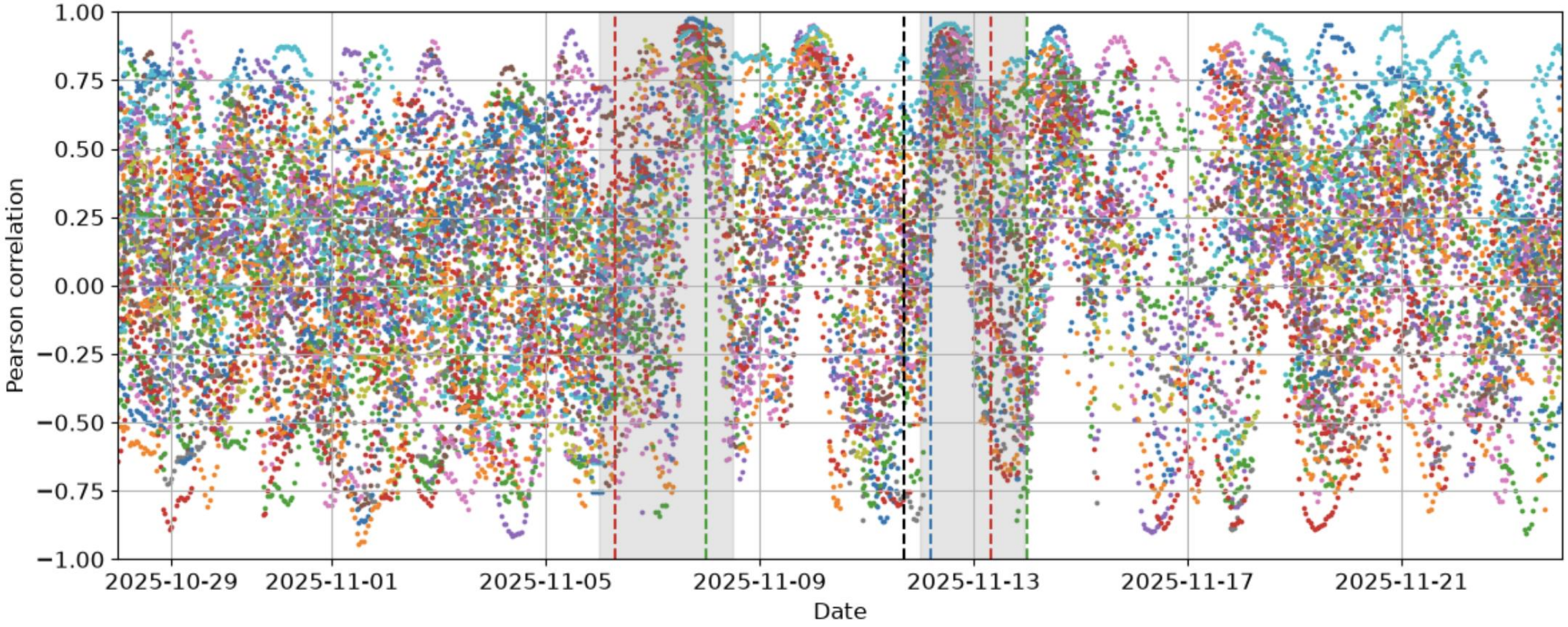
| Date (UTC) | Timestamp (UTC) | Minimum Dst | Maximum K_p | Event |
|---|---|---|---|---|
| 2025-11-06 | 07:00 | −116 nT | 7− | Intense storm |
| 2025-11-08 | ? | −84 nT | 6 | Disturbance |
| 2025-11-12 | 05:00 | −217 nT | 9− | Severe storm |
| 2025-11-13 | 08:00 | −143 nT | 7+ | Intense storm |
| 2025-11-14 | ? | −65 nT | 1 | Disturbance |



# Ricerca di FD legati al GLE del 11/11/2025



# Correlazione periodo 11/11/2025



# Solar Protons Event 8/6/2024

