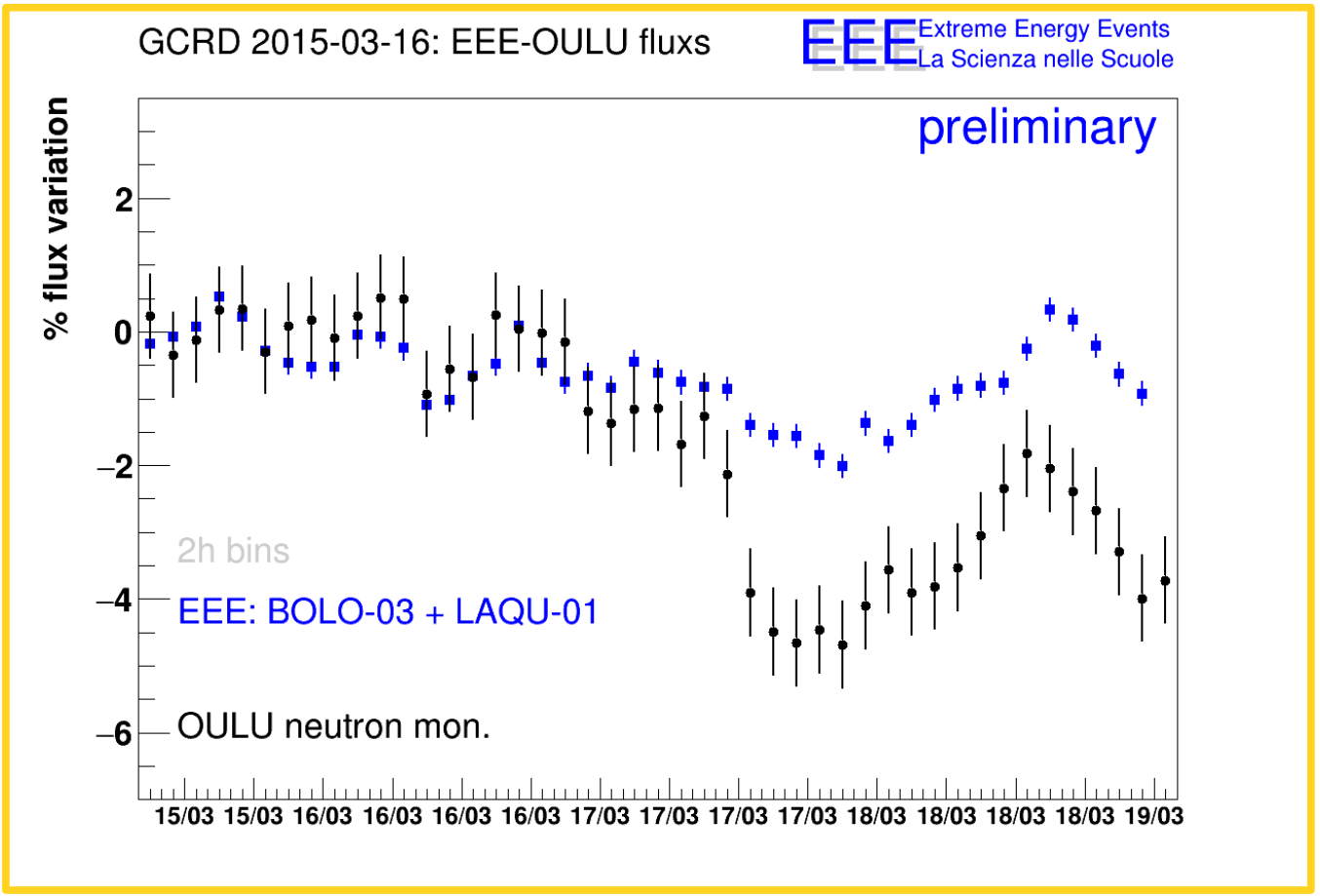
GCRD:

Corrections and Stability

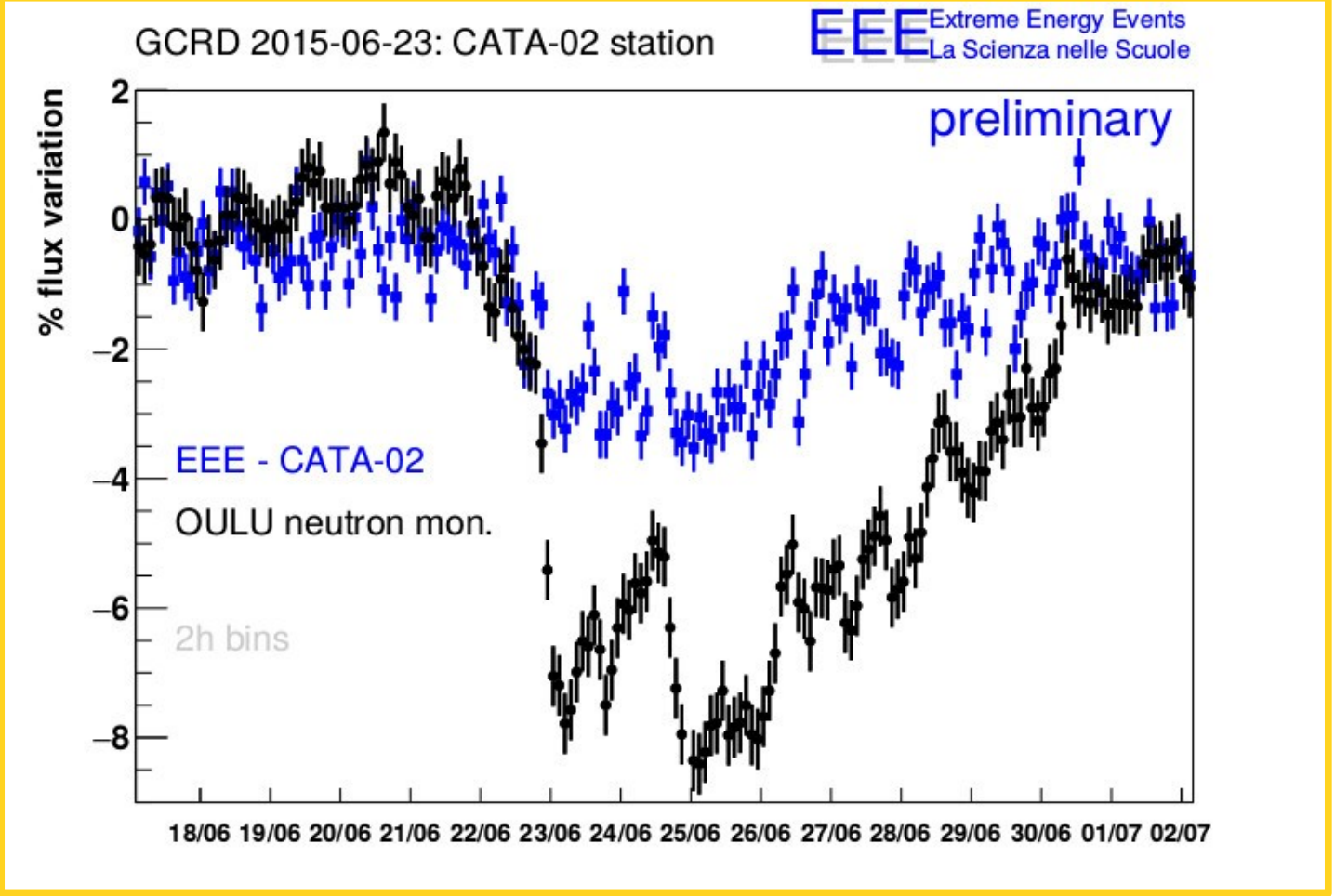
AM 2017 04 26

We observed 4 GCRD Since Pilot RUN



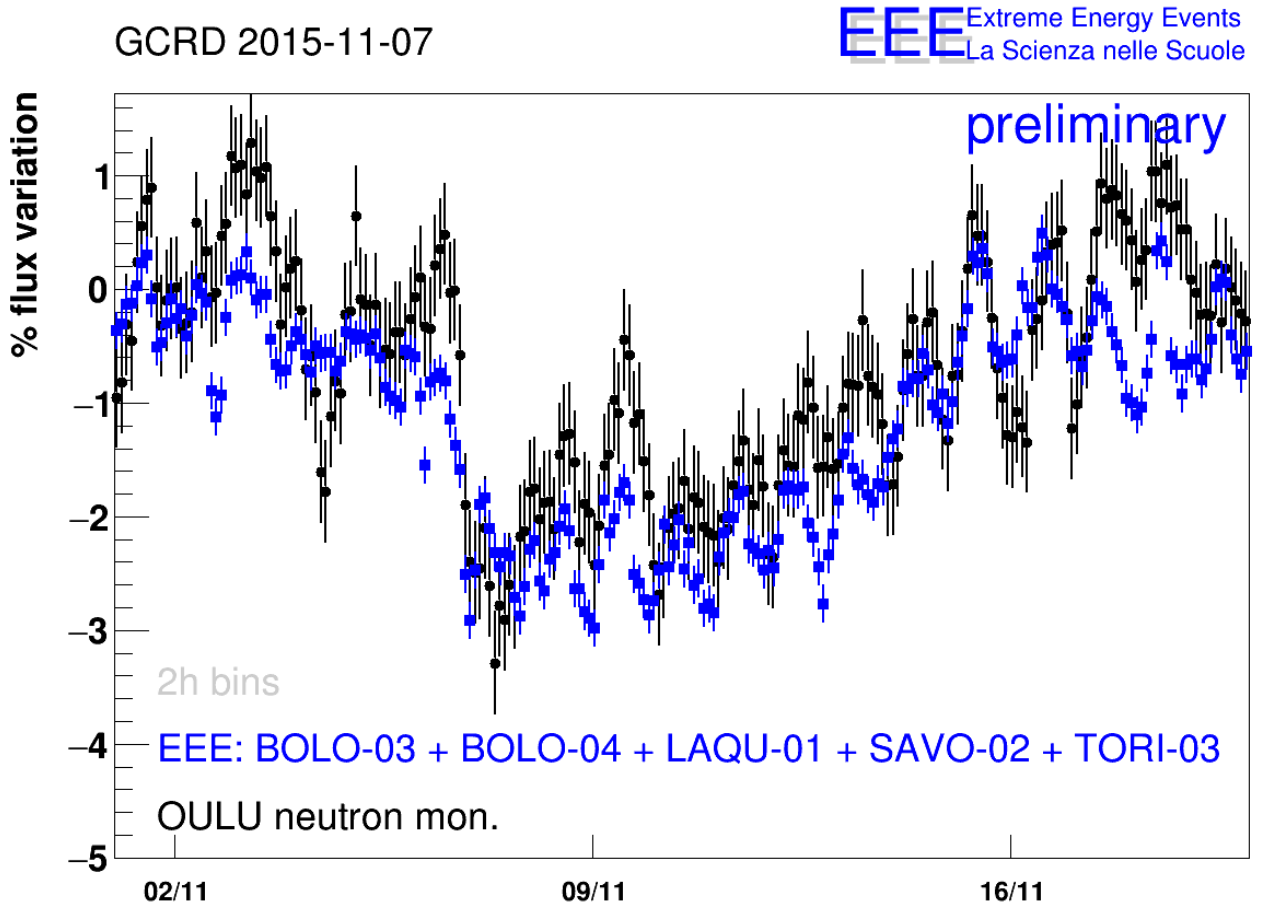
2 stations, 2%, strongly different w.r.t. NM

We observed 4 GCRD Since Pilot RUN



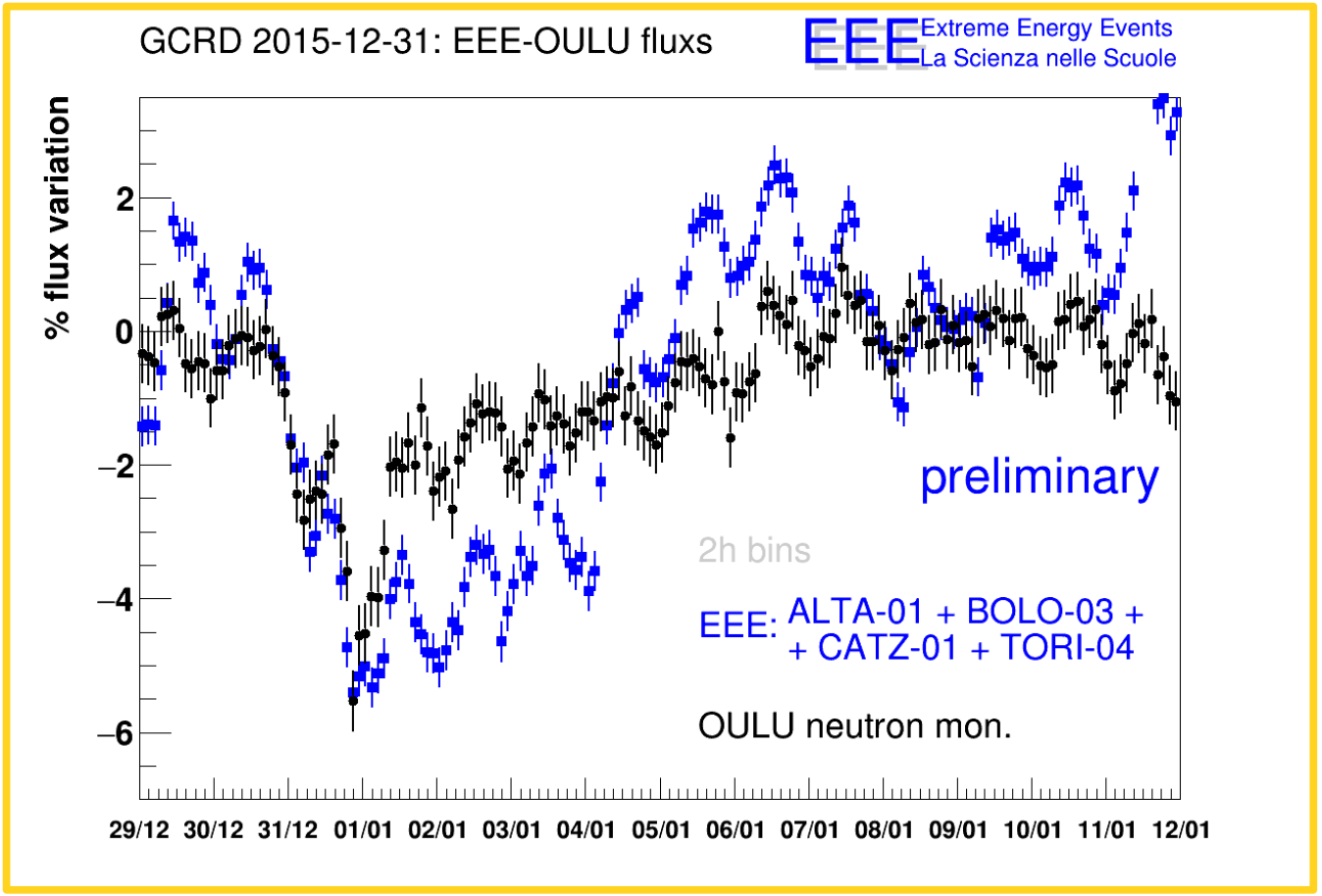
1 station, 4%, strongly different w.r.t. NM

We observed 4 GCRD Since Pilot RUN



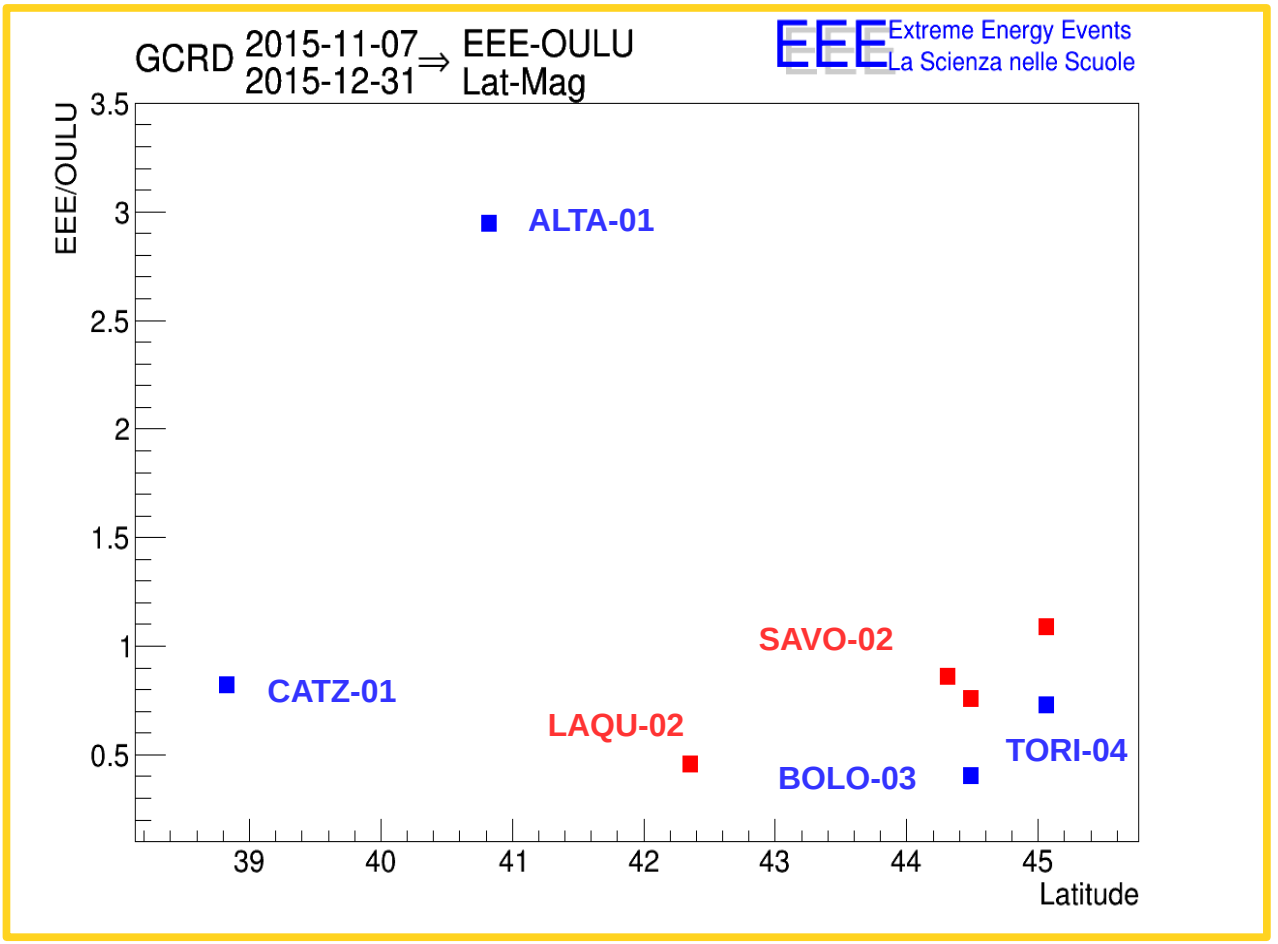
5 stations, 3%, good agreement w.r.t. NM

We observed 4 GCRD Since Pilot RUN



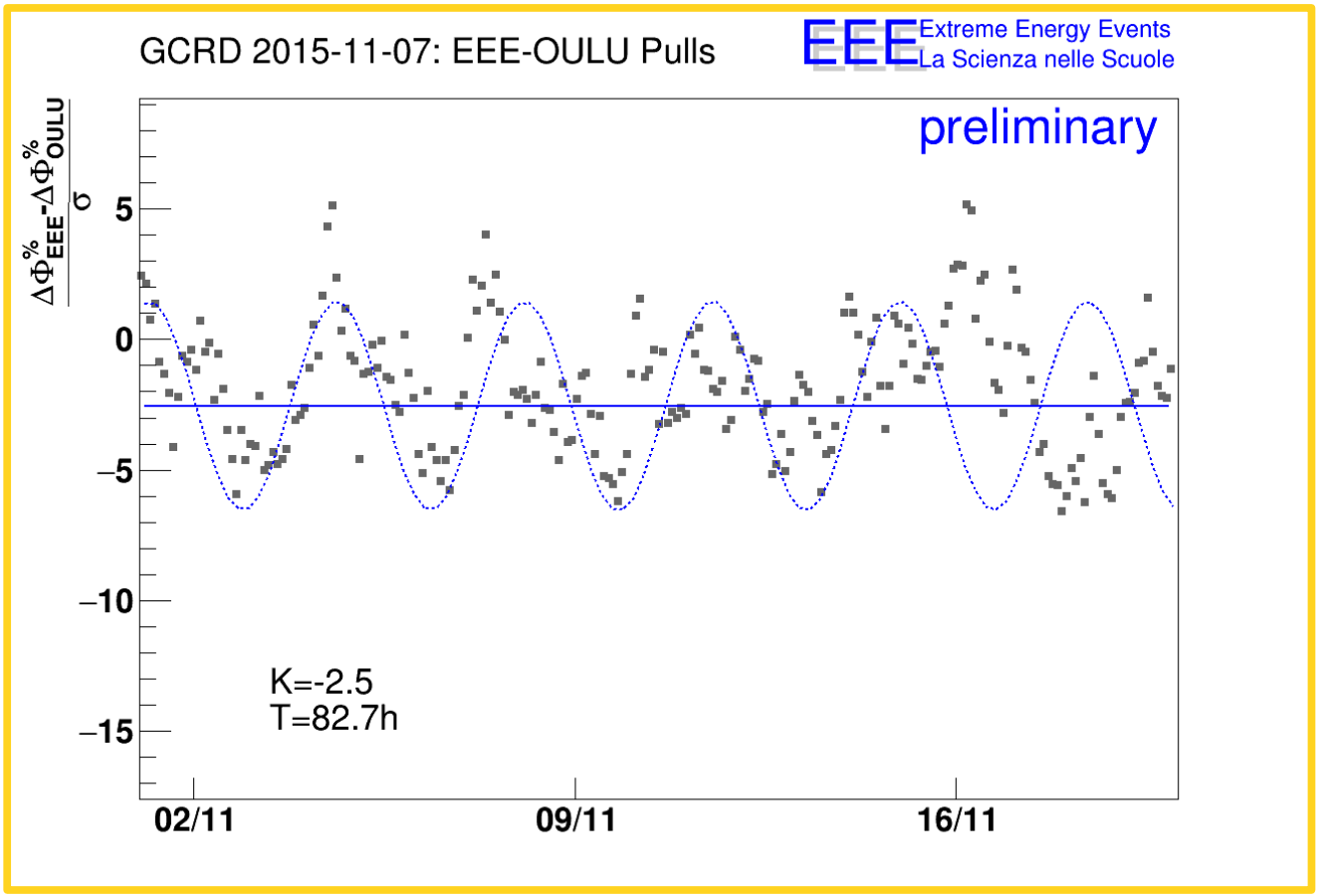
4 stations, 6%, strongly different w.r.t. NM

We checked for additional information to be extracted



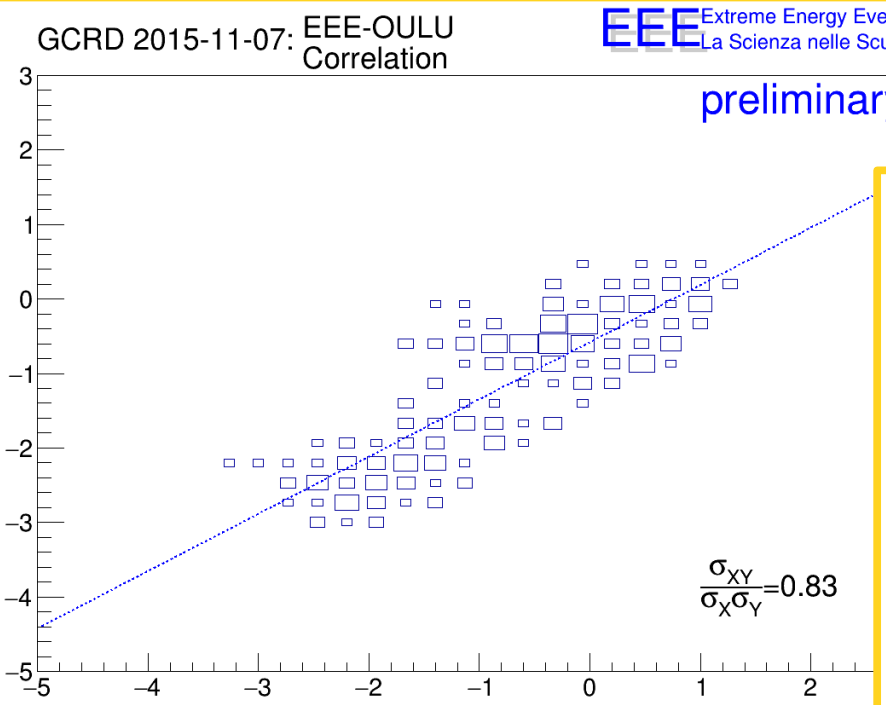
Latitude dependence... + day-night fluct magnitude + other parameters

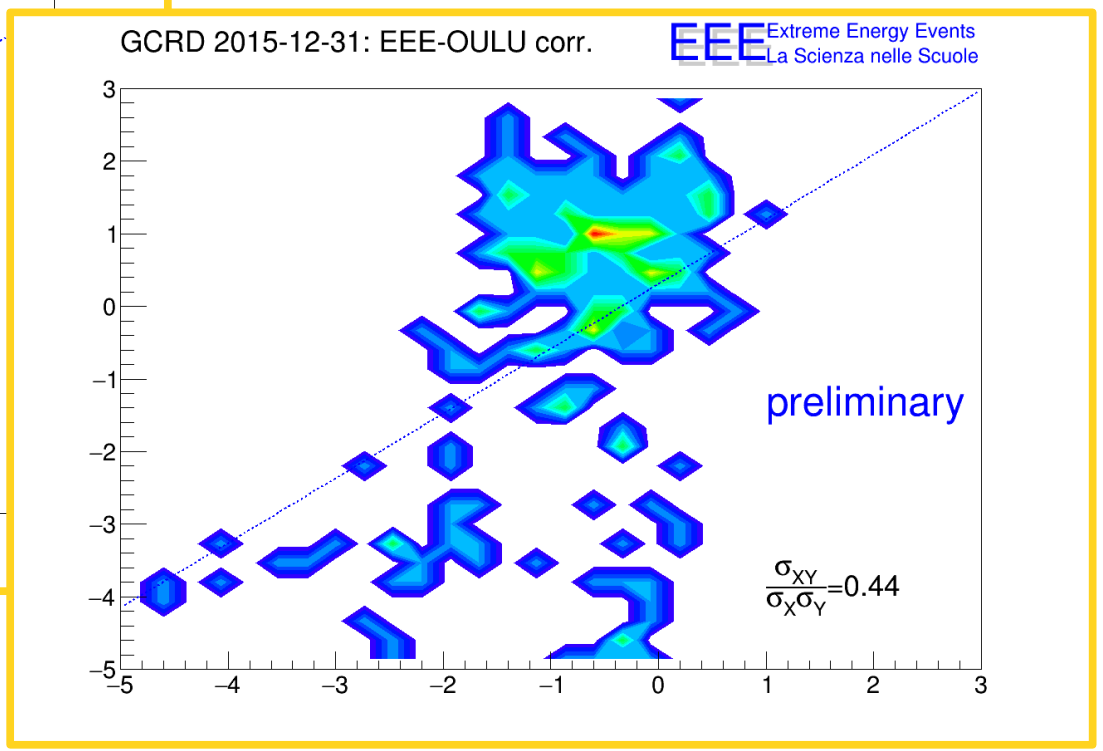
There are unclear features:



NM-EEE time displacement
well beyond longitude effects (83 hours)

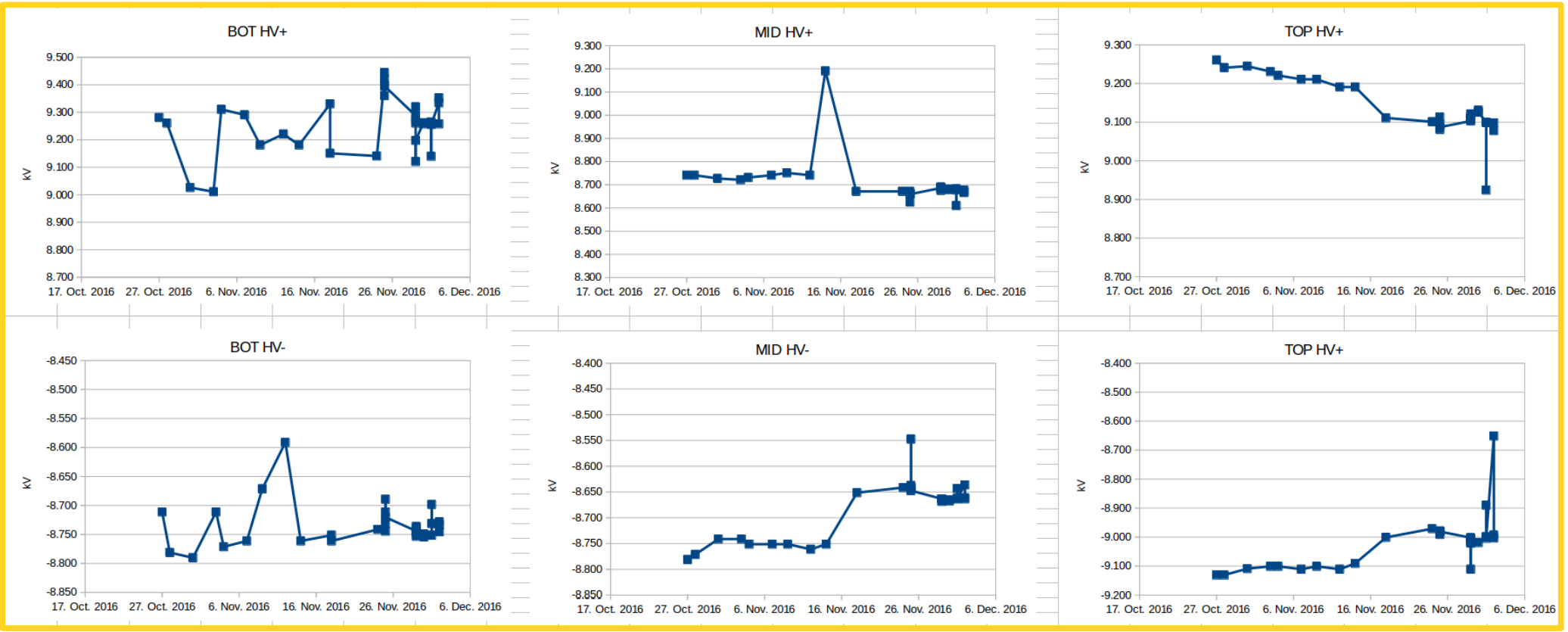
There are unclear features:





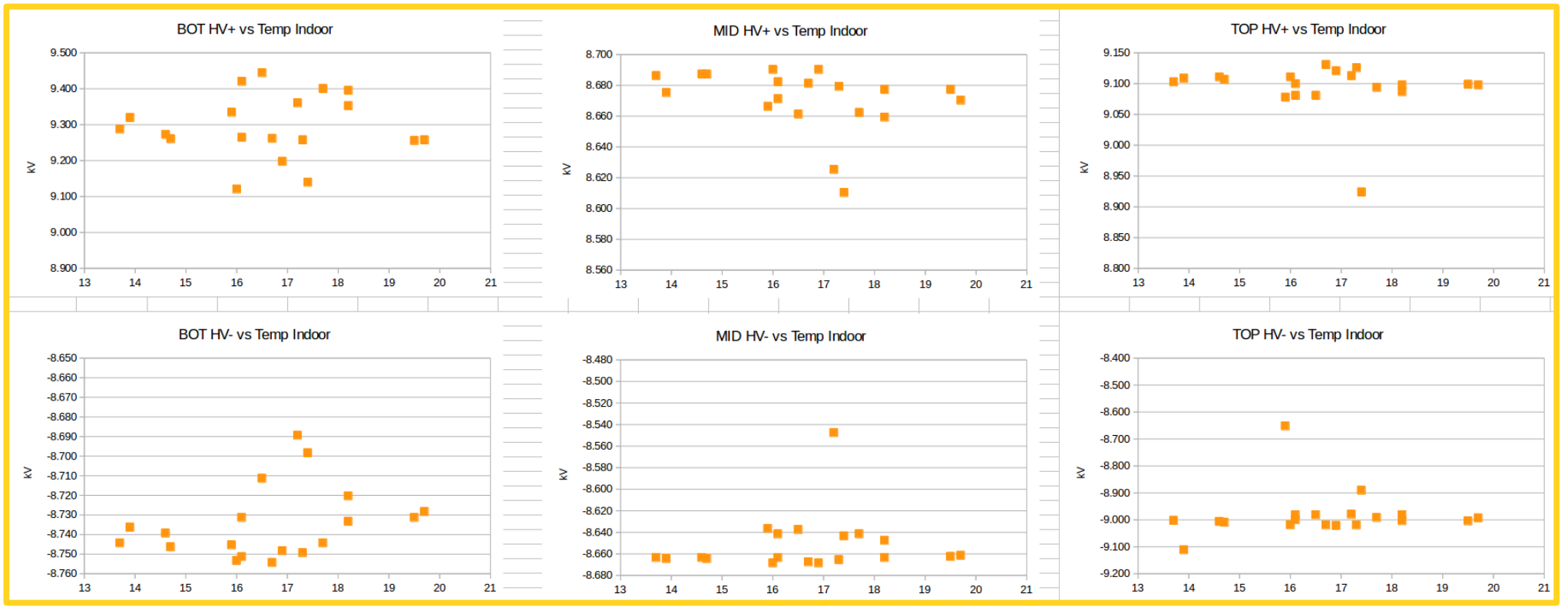
Low NM-EEE correlation is some case

Now trying to systematically study Corrections and Detector Stability



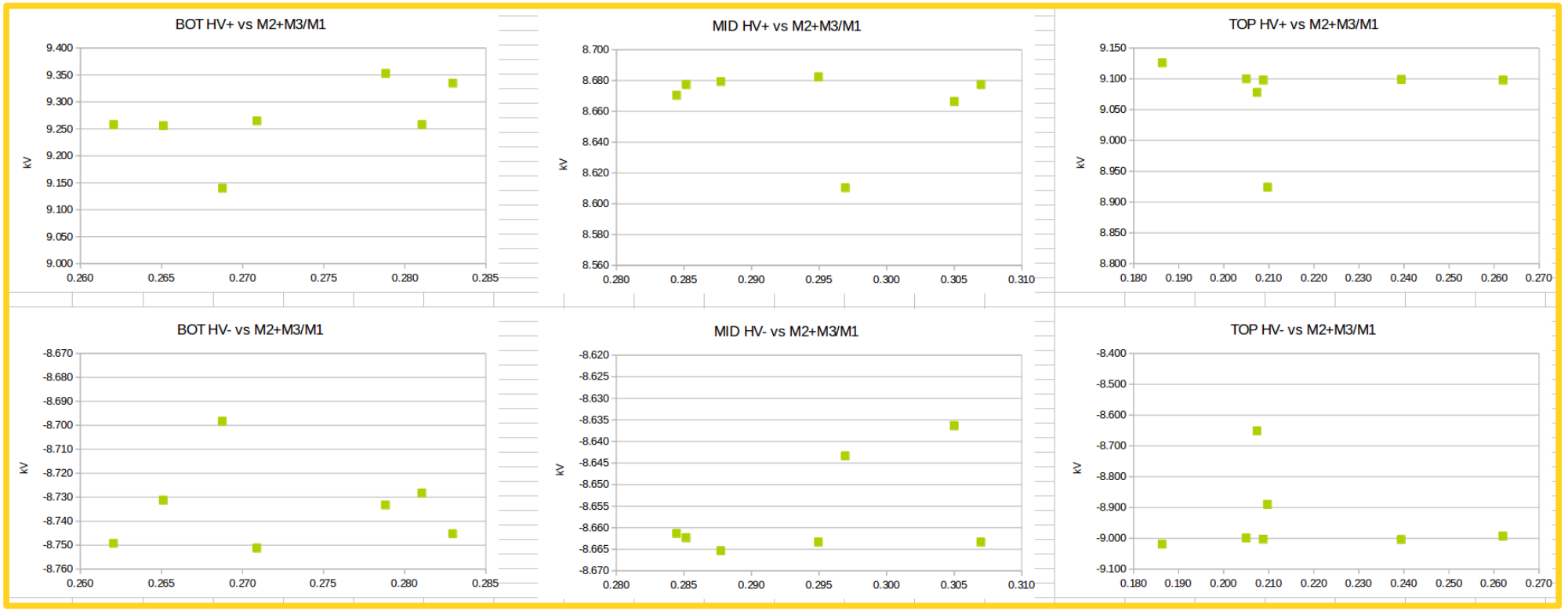
HV fluctuation and working point: 100-400 V fluctuations

Now trying to systematically study Corrections and Detector Stability



HV fluctuation shows no Temperature correlation

Now trying to systematically study Corrections and Detector Stability



and no correlation with multiplicities

Several parameters involved in unstabilities:

HV fluctuations:
Marco S. is working on stabilizing (HW)
On CATZ-01 and soon on TORI-01

This item is not related to the
4 GCRD we want to publish
but it's fundamental for extensive GCRD
measurements in future

Several parameters involved in unstabilities:

+

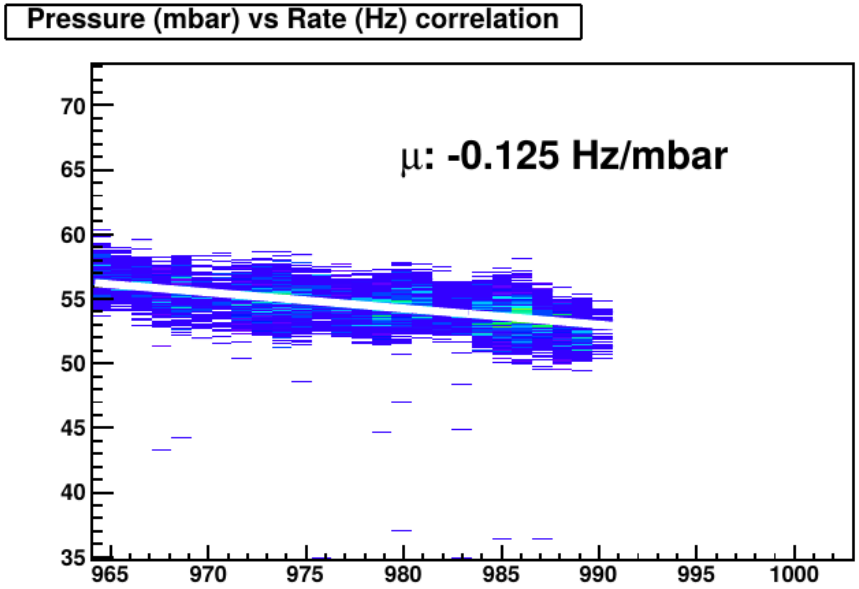
1. Barometric correction stability
2. HVeff temperature dependance

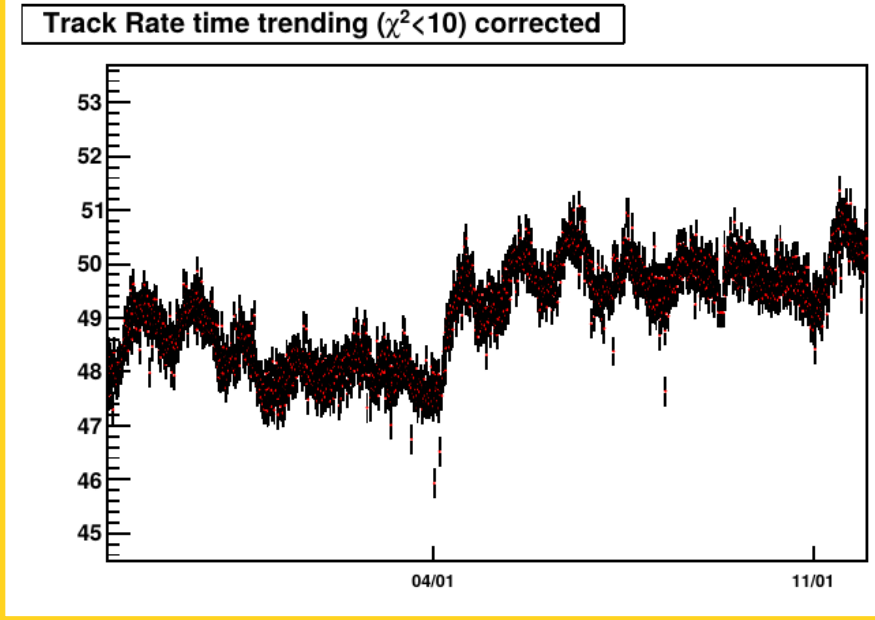
These two parameters have to be corrected for reaching best confidence on the 4 GCRD already observed

Barometric corrections: Studying stability on the long period

what we usually do for each station
(e.g. TORI-04 before 2016-01-01 GCRD)

1. selecting a period w/o GCRD
2. correct and get the observation





But how much we can trust the correction?

Using data on the long period
2016-01 ----- 2017-01
We sistematically extracted
Barometric correction
on the whole period

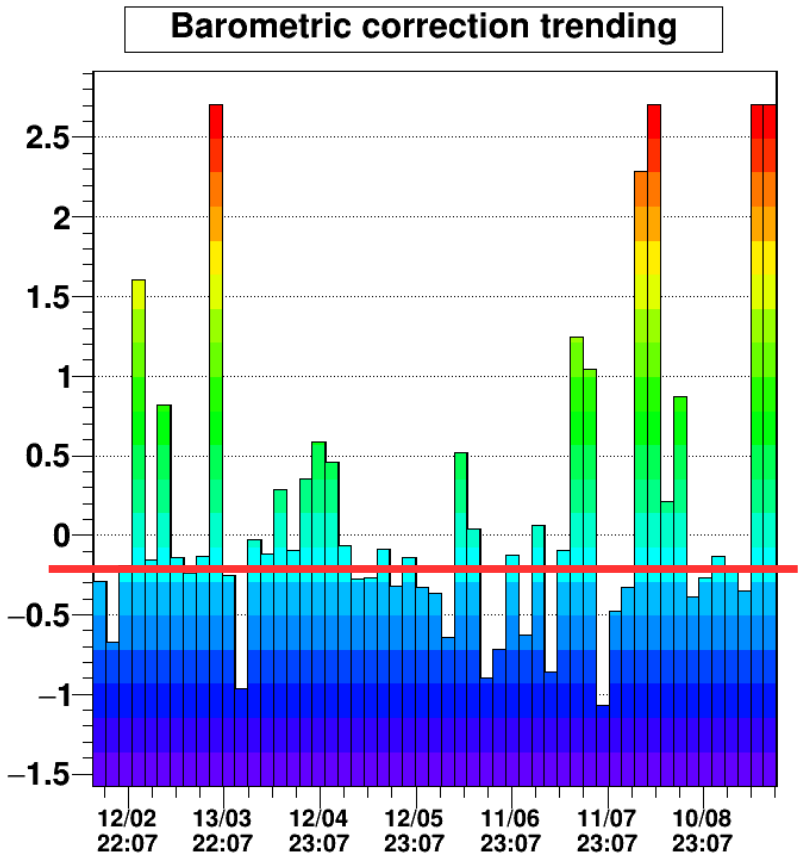
Asking for:

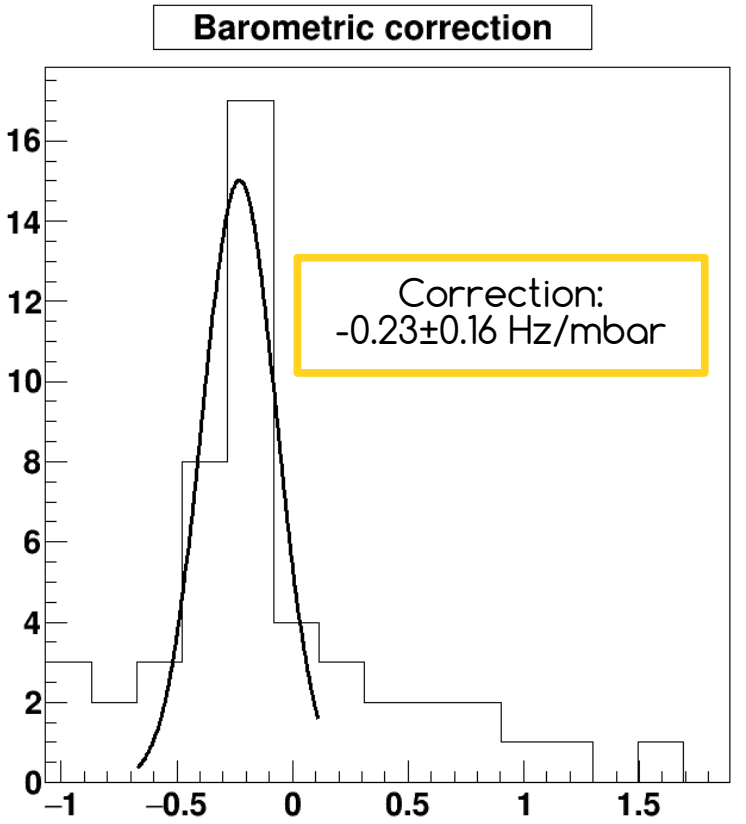
>1000 Pressure-Rate measurements per extraction

> 10 mbar pressure variation

5 Hz < track rate < 70 Hz

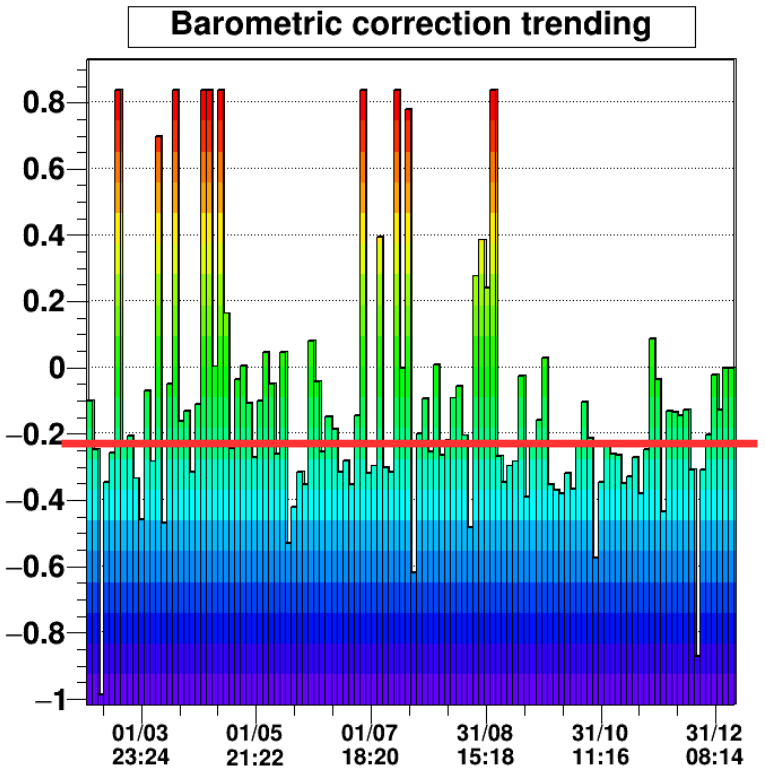
On stations involved in 2016-01-01 GCRD: ALTA-01

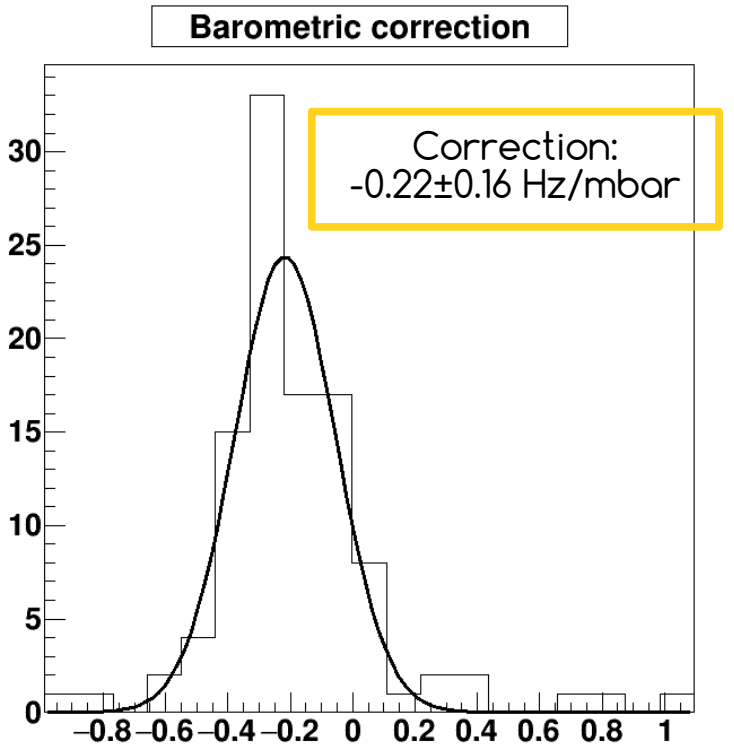




Uncertainty on Bar. Corr. very high
Corrections of the same magnitude as GCRD

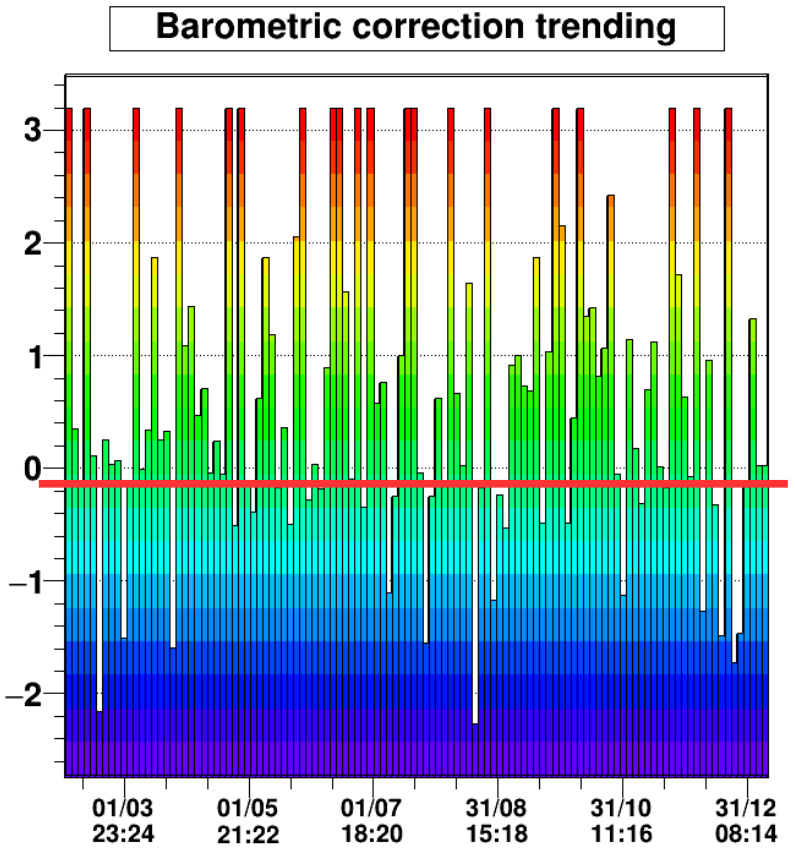
On stations involved in 2016-01-01 GCRD: TORI-04

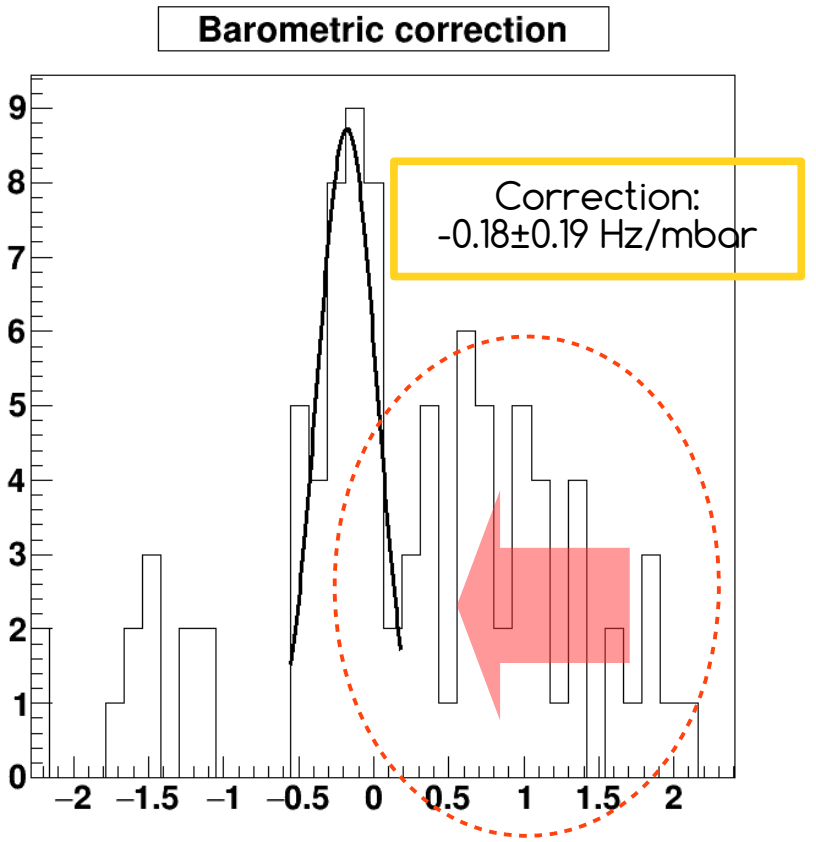




Uncertainty on Bar. Corr. very high
Corrections of the same magnitude as GCRD

On stations involved in 2016-01-01 GCRD: CATZ-01





Measurement clearly uncorrelated (Temperature dependence or HV unstability?)

Next steps for the array stability:

Marco is working on a

feedback on HV + MRPCs Press/Temp/HV read out
which shoud be working in the autumn
(see Marco for precise timing)
The system is already working as a
Press/Temp/HV read out at CATZ-01

VERY IMPORTANT: writing HV on raw data files

unfortunately a lot of telescope
are equipped by stand-alone LV power supplies
anyhow they can be read out
– TORI-03 activity ongoing -

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+

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