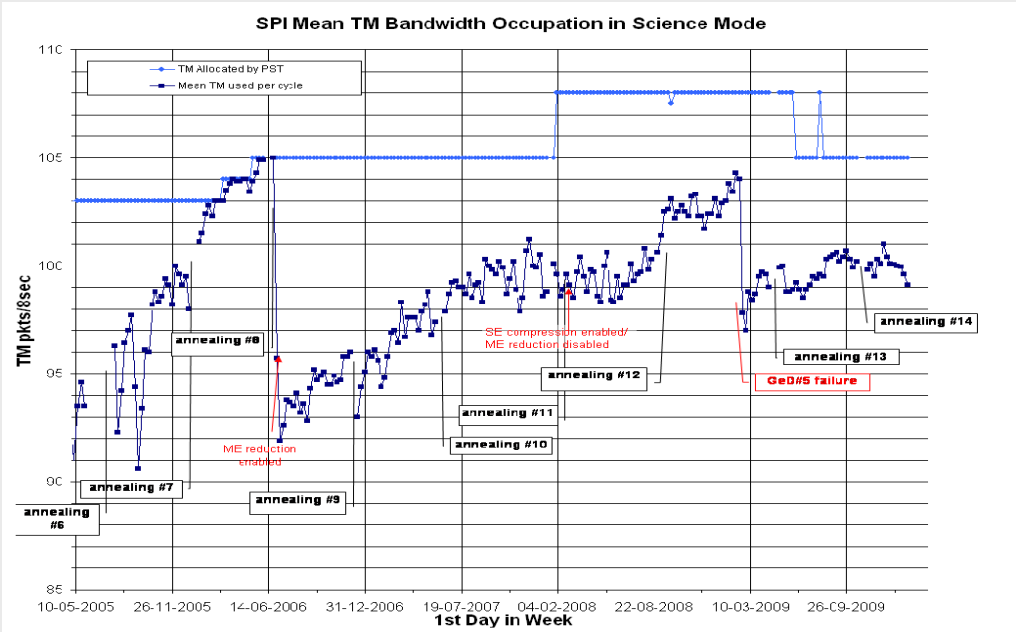
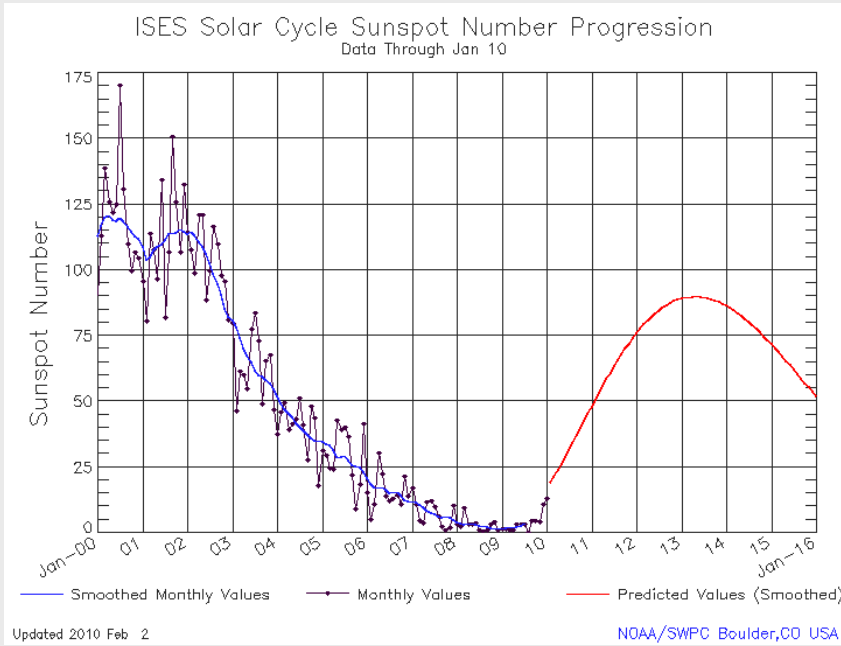
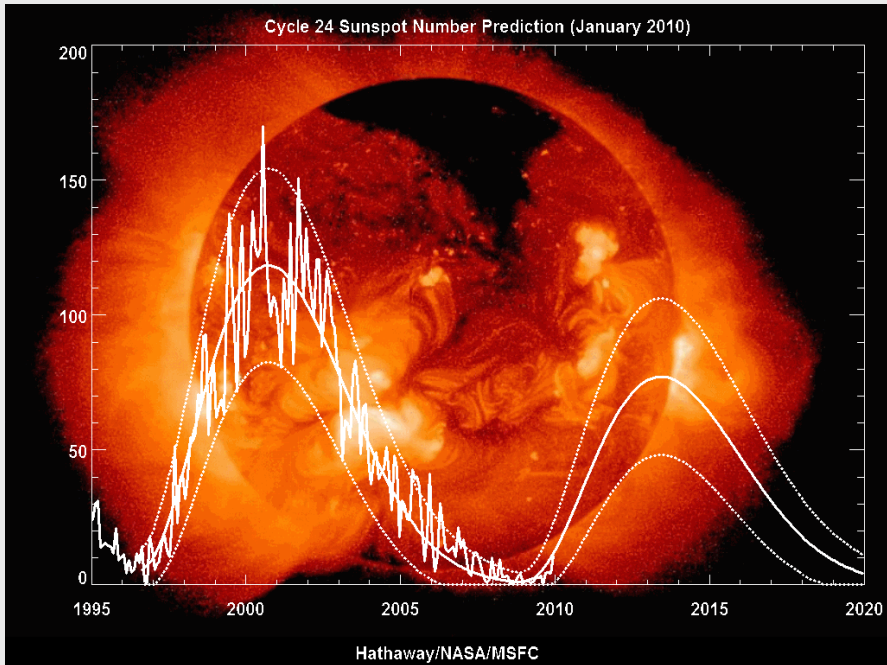
SPI STATUS


SPI Mean TM Bandwidth Occupation in Science Mode
TM Allocated by PST
Mean TM used per cycle
TM pkts/8sec
annealing #6
annealing #7
annealing #8
annealing #9
annealing #10
annealing #11
annealing #12
annealing #13
annealing #14
ME reduction enabled
SE compression enabled/ ME reduction disabled
GeD#5 failure
10-05-2005
26-11-2005
14-06-2006
31-12-2006
19-07-2007
04-02-2008
22-08-2008
10-03-2009
26-09-2009
1st Day in Week


ISES Solar Cycle Sunspot Number Progression
Data Through Jan 10
Sunspot Number
Smoothed Monthly Values
Monthly Values
Predicted Values (Smoothed)
Updated 2010 Feb 2
NOAA/SWPC Boulder,CO USA


4-Jan
11-Jan
18-Jan
25-Jan
1-Feb
E3340 E3341 E3342 E3343 E3344 E3345 E3346 E3347 E3348 E3349 E3350 E3351
E3352 E3353 E3354 E3355 E3356 E3357 E3358


Cycle 24 Sunspot Number Prediction (January 2010)
Hathaway/NASA/MSFC

IASW 4.3.5

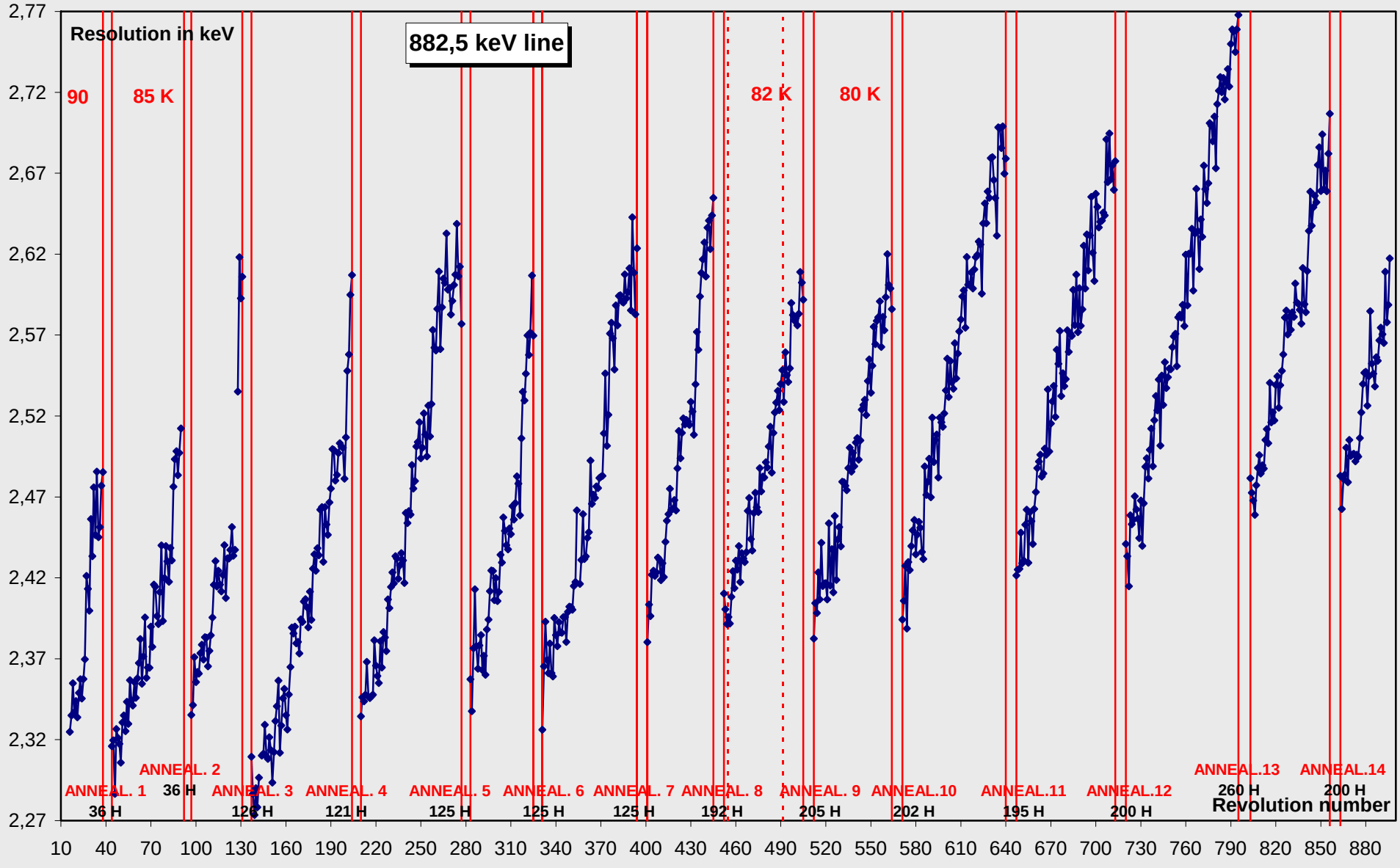
- Automatic reduction of HV to 1500V below the belts.
- On-board compression of PE events:
  - Compression without loss gain 3-4 pkts
  - Compression+reduction gain 9 Pkts….
- Test on november 5th:
  - New algorithm waiting activation.
- Aim: recover some margin for GRB and strong transient event.
- Best answer to “bright event” action….!

ANNEALING: 14th SUMMARY

- Start: October 19th
- 105C on October 21th
- 200 hours at 105C
- November 1st: CDE on
- November 4th CDE2 pair stops for 2hrs: LCL trip
- November 5th Camera switch-on at 98k
- Smooth reactivation with some GeD pollution
- Nominal HV settings at 80K
- Recovery not perfect but “good”

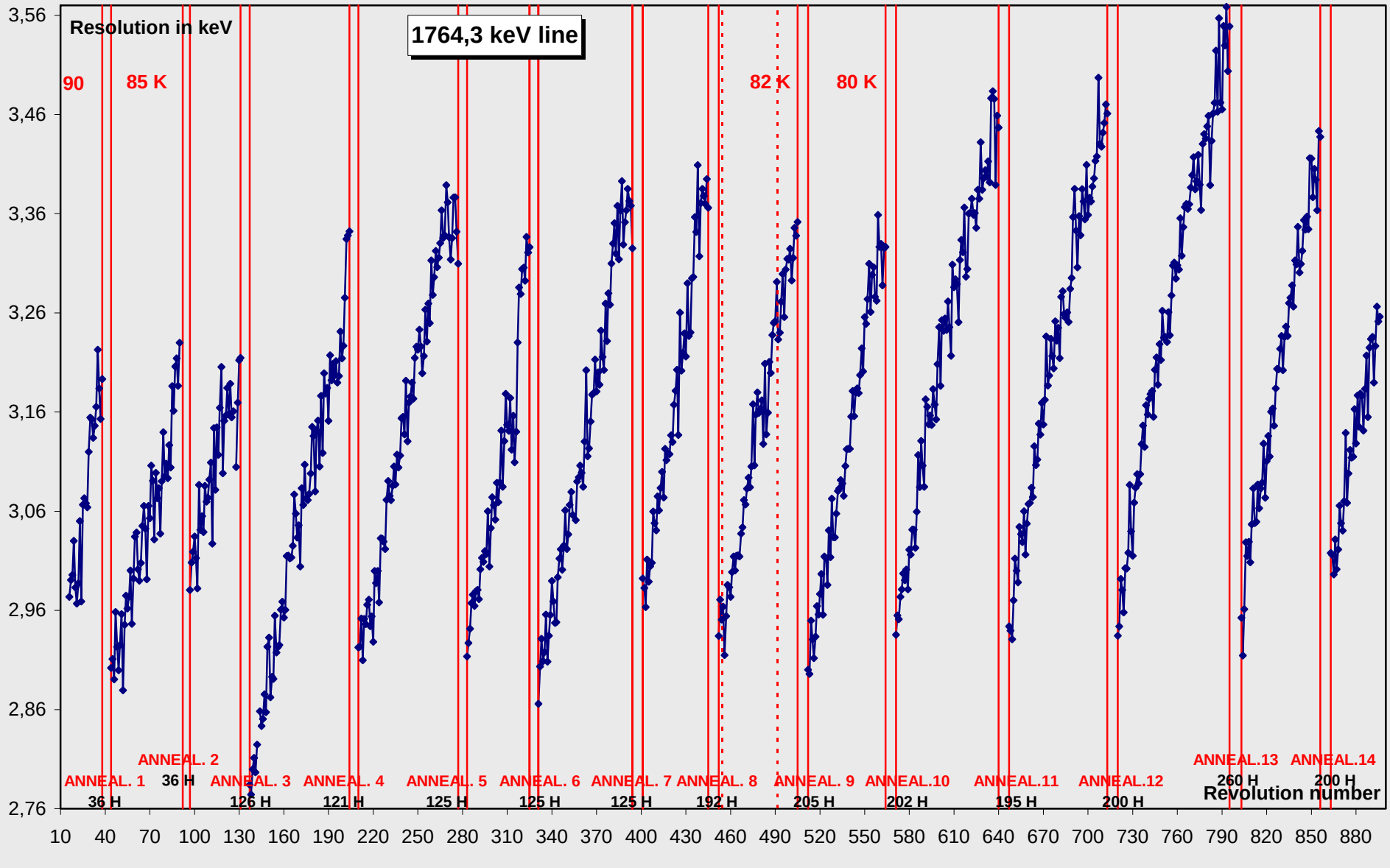
ENERGY RESOLUTION HISTORY: 882.5 keV

- Regular annealing (GeD at 105C) restore GeD energy resolution.



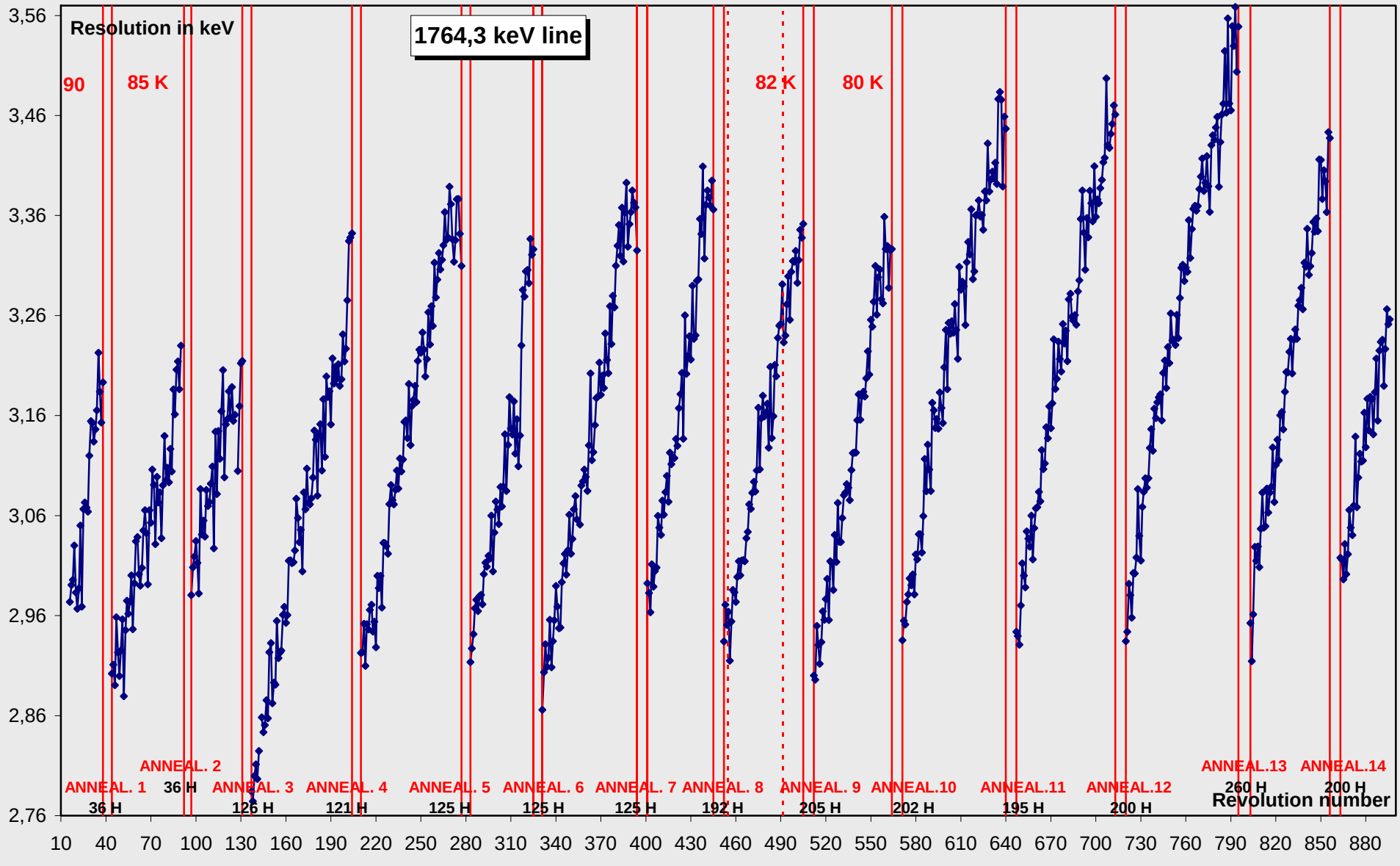
ENERGY RESOLUTION HISTORY: 1764.3 keV

- Regular annealing (GeD at 105C) restore GeD energy resolution.



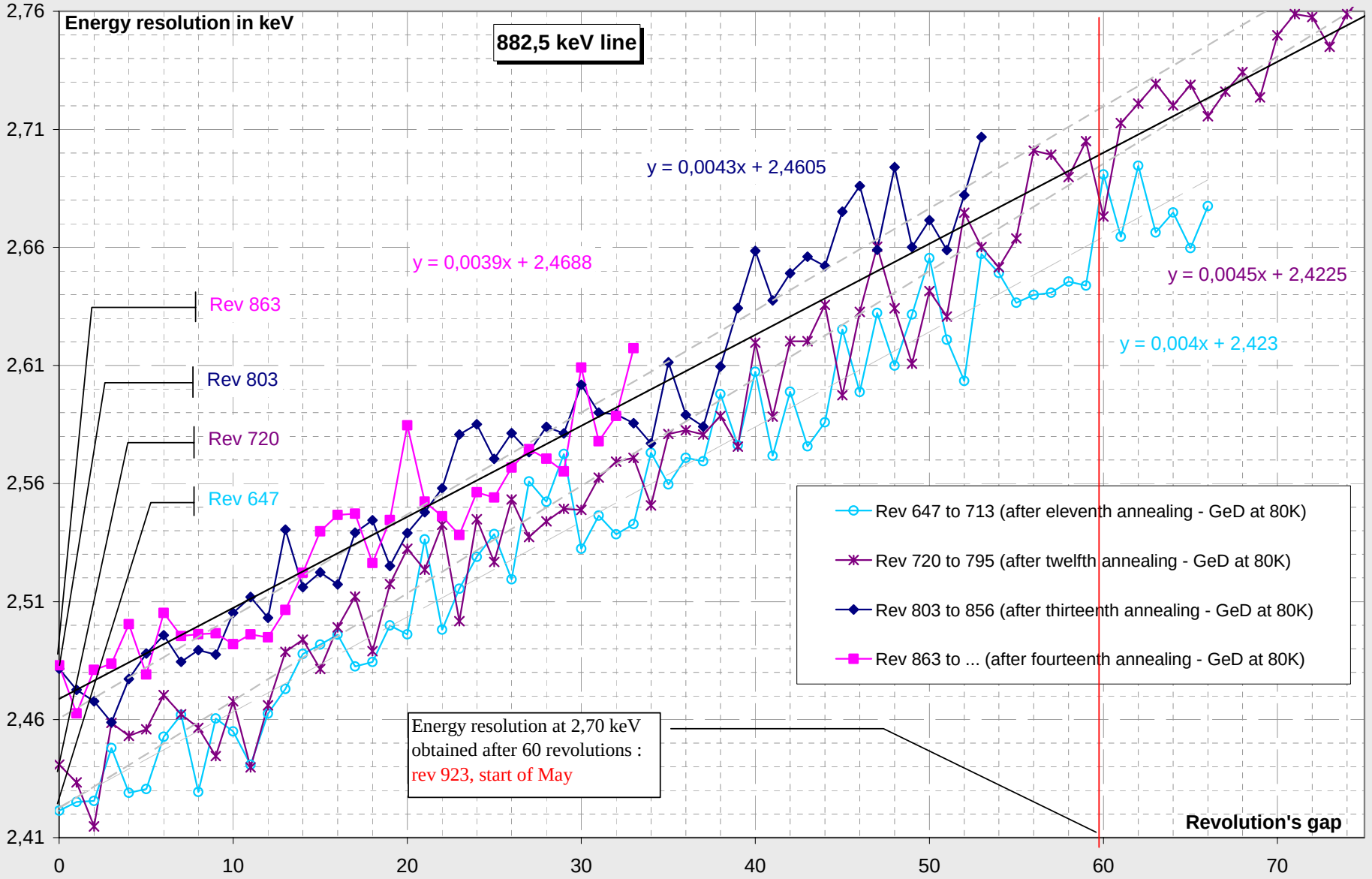
ENERGY RESOLUTION HISTORY: 2754 keV

- Regular annealing (GeD at 105C) restore GeD energy resolution.



NEXT ANNEALING, IF TEMPERATURE < 81K

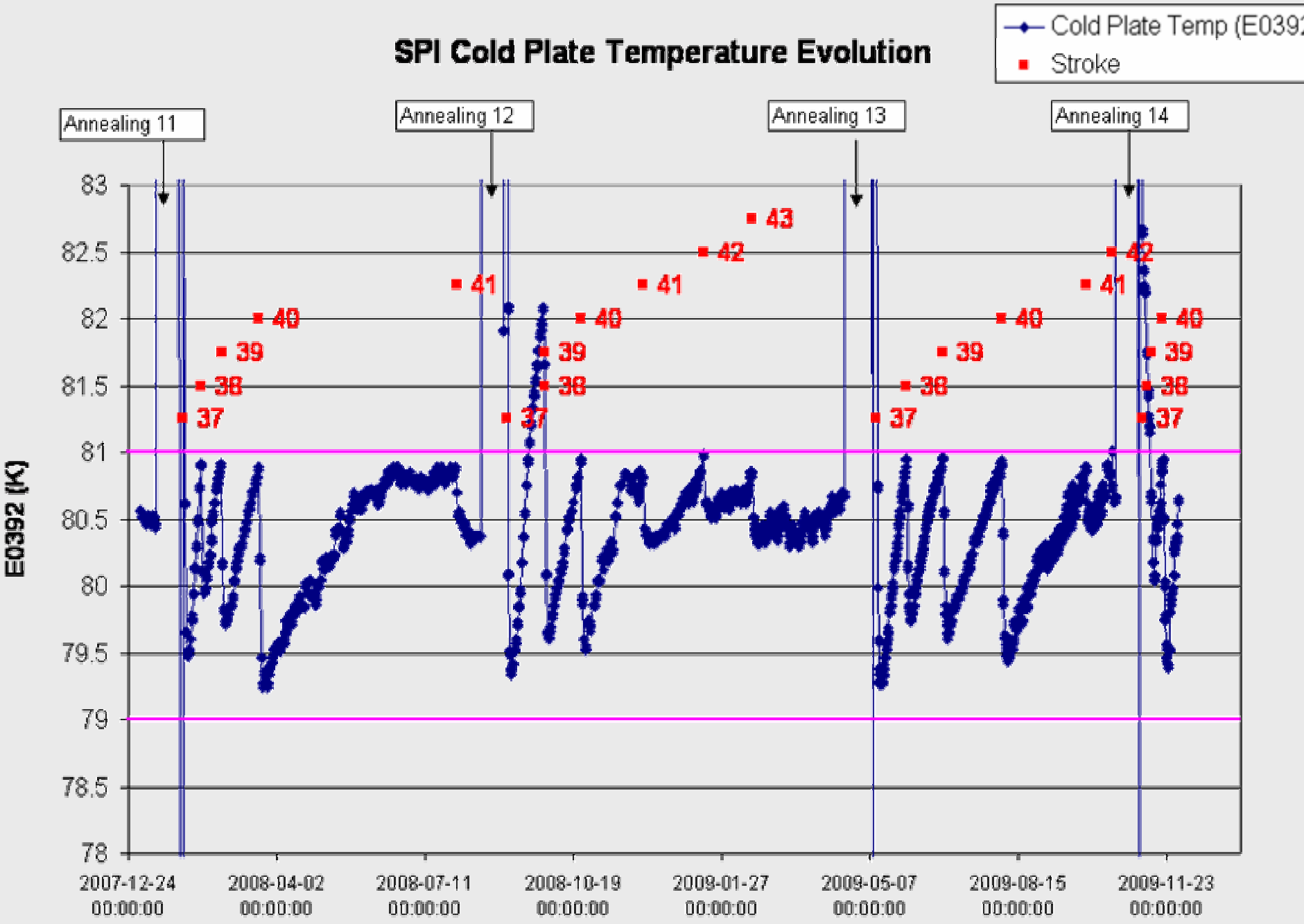
- Current extrapolation gives April 15th - May 1st



LCL “ANOMALY”

- November 4th LCL powering CDE2 opened
  - During the cooling phase GeD’s at 120K
  - With compressors at full stroke
  - During working hours
- CDE2 stops for 2hrs:
  - 13K Cold finger temperature increase
  - CDE1 was master then didn’t stop
- Smooth reactivation of CDE2

LCL “ANOMALY” ---- CONSEQUENCES



LCL “ANOMALY” ---- CONSEQUENCES

- Cooling system efficiency decrease is due to contamination transfer (We hope !)
- This very high degradation rate is probably due to the cold tip reheat….
- To compensate:
  - Stroke increase
  - in practice this is limited by the LCL max current or machines temperature.
- Then the temperature will drift, then annealing….
- Aim is to push annealing in April:
  - End of eclipse season
  - “nominal” annealing date

LCL “ANOMALY”

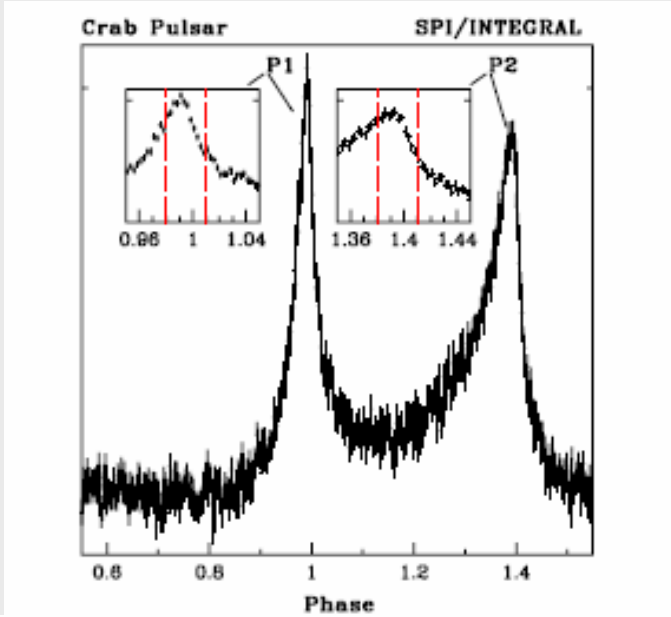
- LCL trip are more and more frequent
- Consequences on SPI are very high
- This case was easy…in case of problem over night on the master CDE it would have been worse
- We have to retry to switch to backup configuration:
  - 1 LCL per compressor.
- We try to improve the cooling system operations:
  - Keep the radiator heaters on during annealing
  - Improve the radiator regulation using on-board functions

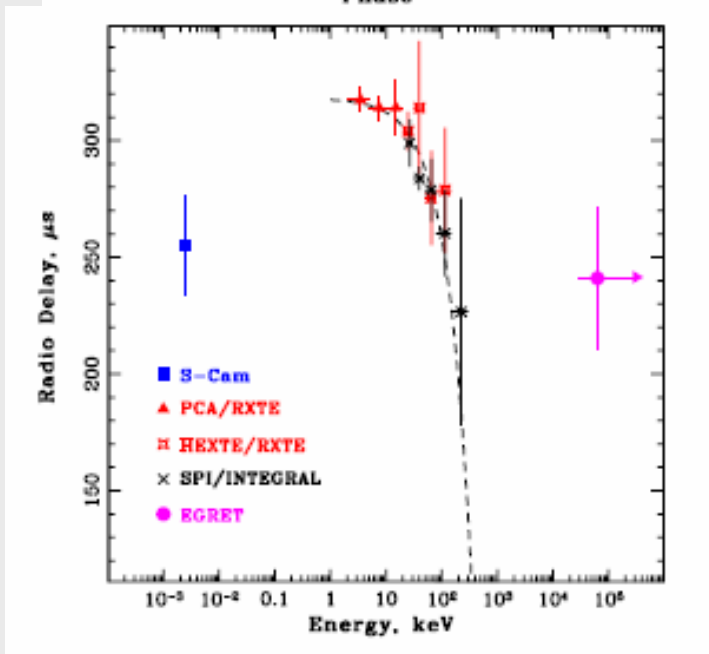
The Crab pulsar

(Molkov, Jourdain and Roques, accepted to ApJ)

- Intensive work on Crab pulsar by S. Molkov
- Detection of some ground station synchro problems

  Solved by iterative work with ESOC
- Optimization of S/N using SPI response
- Delay of 275+/-15 μs between 20-200 keV and radio
- Hints of delay evolution with photon energy

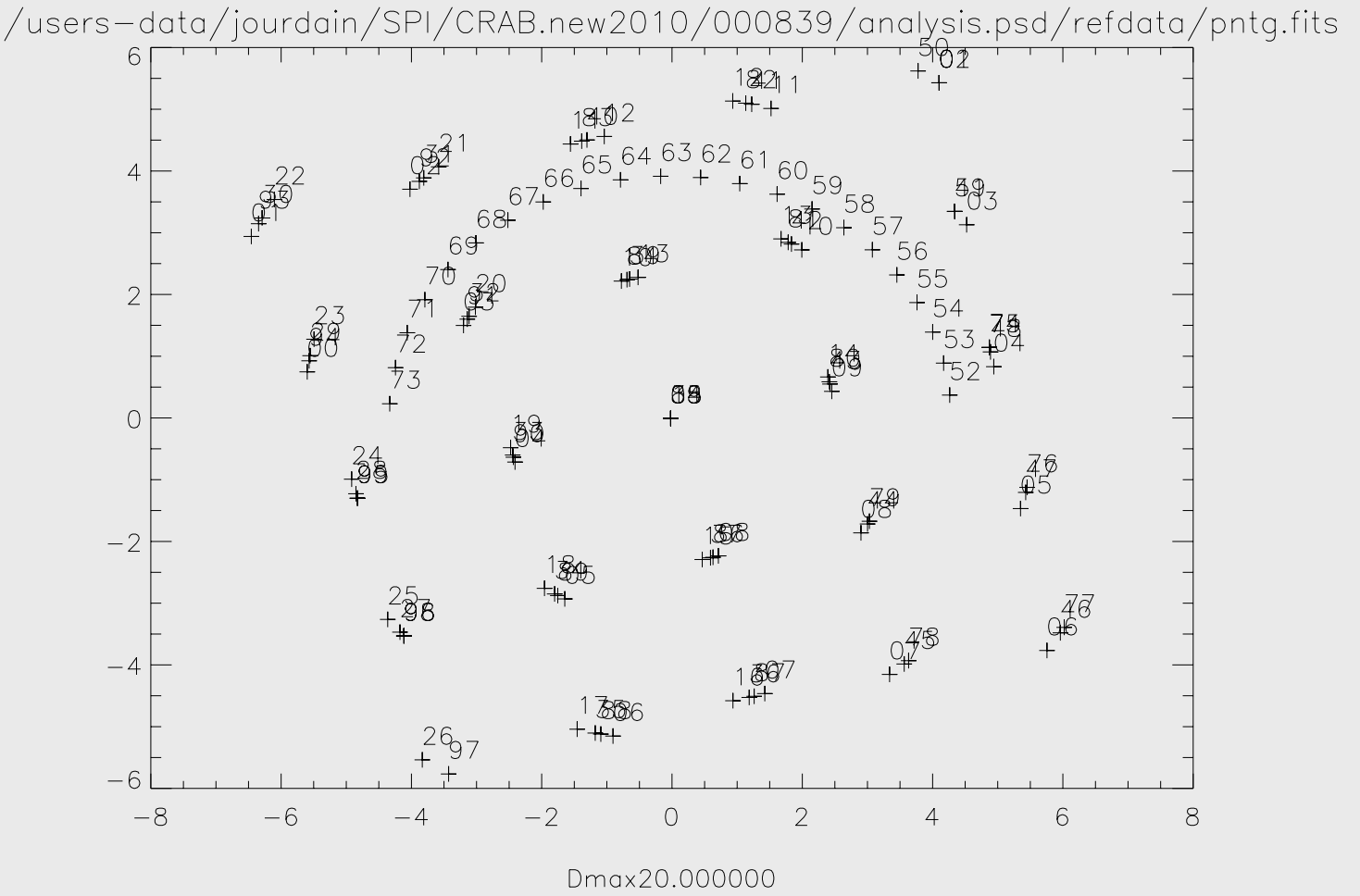




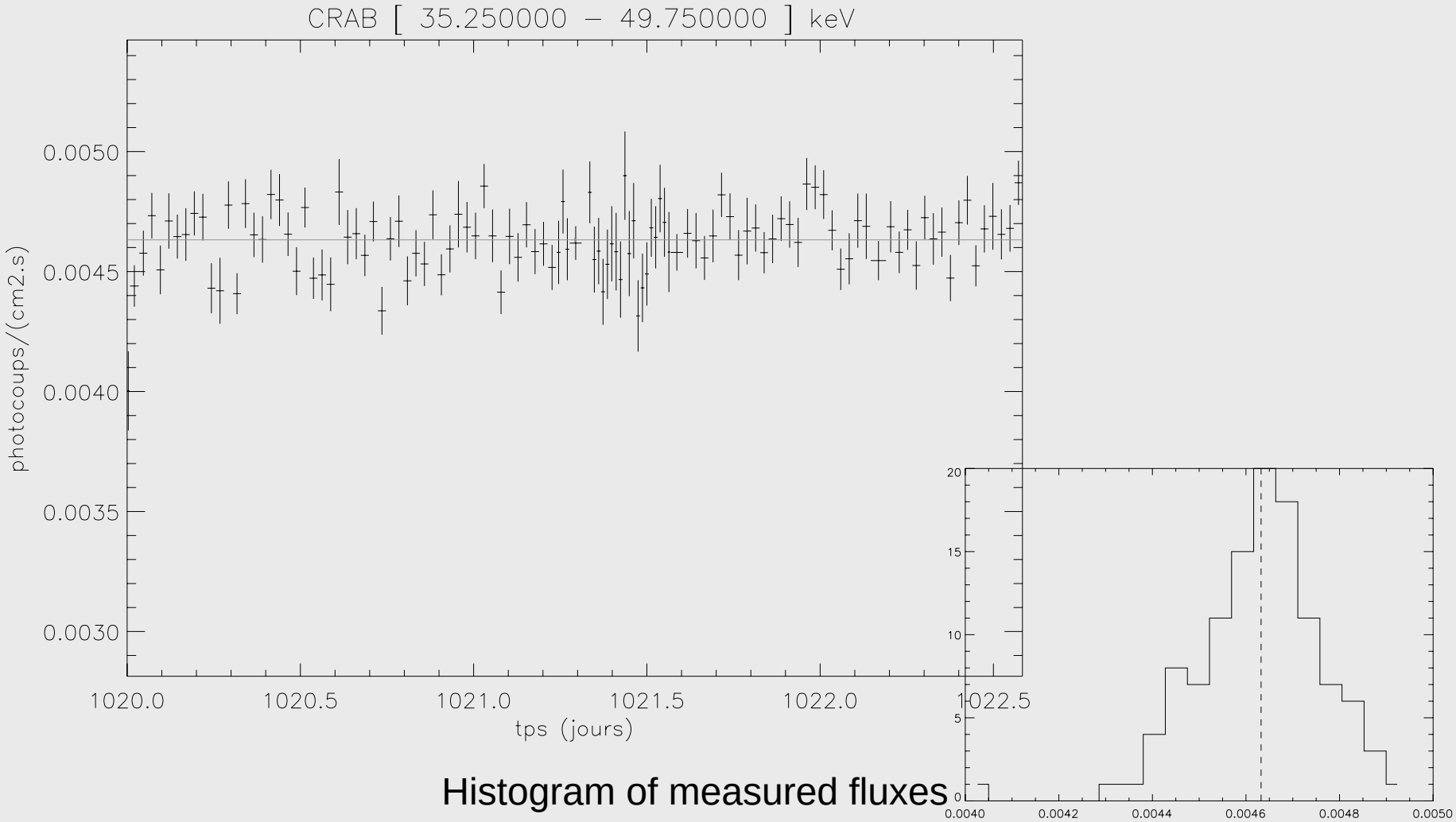
Revolution 839

- First observation on the Crab Nebula with 16 detector configuration
- New dithering (IBIS proposal) « 5x5 wide » 182 ks
- 22 ks JEM-X arc (end of rev 239)

Dithering Pattern



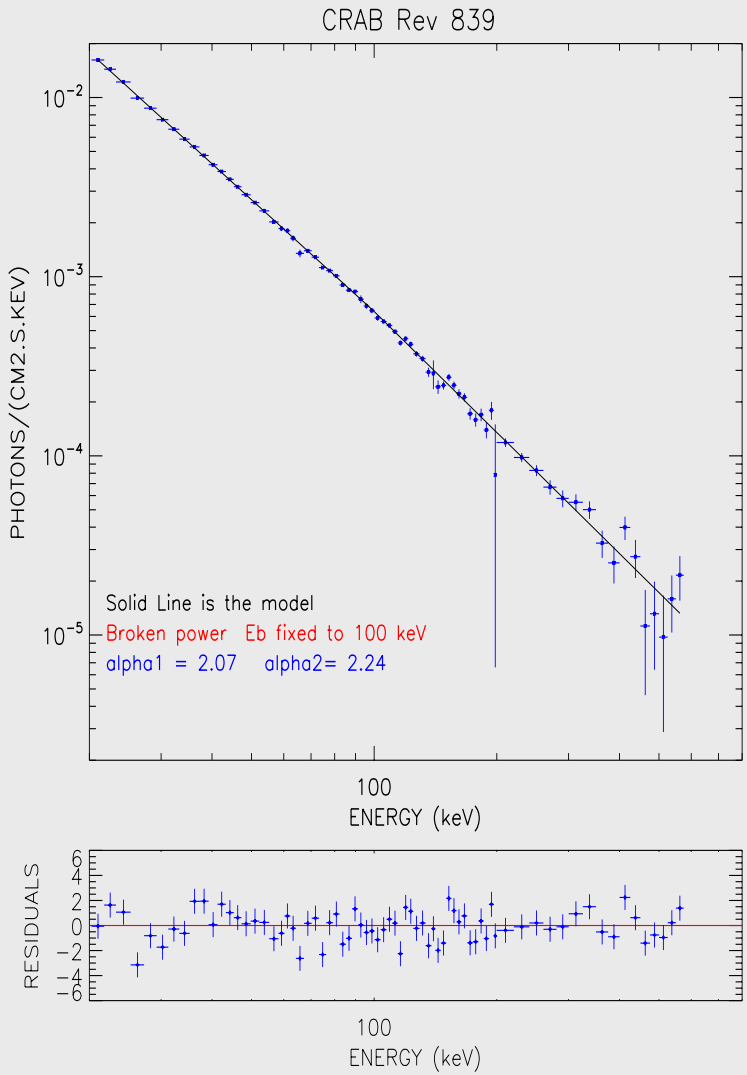
Flux on a scw timescale



Histogram of measured fluxes

REV 839 Averaged spectrum

Parameters	α1	α2	F@ 100 keV ph/cm2 s keV
Rev 839	2.07	2.24	$6.45\ 10^{-4}$
To compare :			
Sum 1 rev 43 to 45	2.07	2.24	$6.45\ 10^{-4}$
Sum 2 rev 239 to 605	2.07	2.25	$6.35\ 10^{-4}$
Sum 3 rev 665 to 727	2.06	2.25	$6.5\ 10^{-4}$



The 16 Ged's calibration files are validated

FUTURE CALIBRATIONS

ONE PATTERN (50ks) PROVIDES « ENOUGH » STATISTICS UP TO ~ 200 keV

- Each annealing increases the central hole size: the high energy efficiency will necessarily decrease.
- 4 Revs allows a good control of SPI up to ~2 MeV
- AIM is to obtain

RELIABLE DATA UP TO A FEW MEV
IN THE STANDARD 5X5 PATTERN
AND
REFERENCE SPECTRA FOR CROSS-CALIBRATION

« good » cross calibration only exists for 16 ks !

IUG has accepted the principle of 4 revolutions per year on Crab