

Status of AGATA detectors

- deliveries
- customer acceptance tests
- neutron damage
- maintenance, annealing, ...

AGATA crystals - overview

21 detectors were **delivered**:

A001, A002, A003, A004, A005, A006, A007, A008
B001, B002, B003, B004, B005, B006
C001, C002, C003, C004, C005, C006, C007

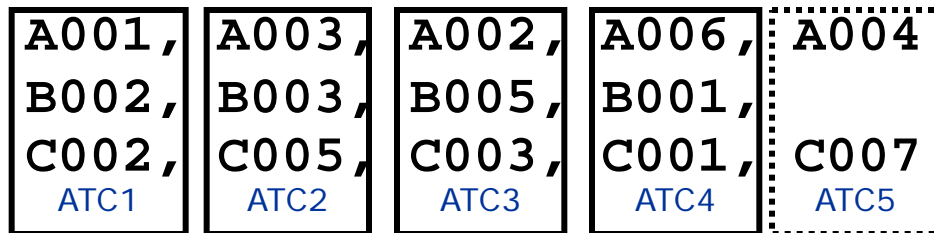
6 detectors are **broken**:

A007, B004, B006
A005, C004, C006, (S003)

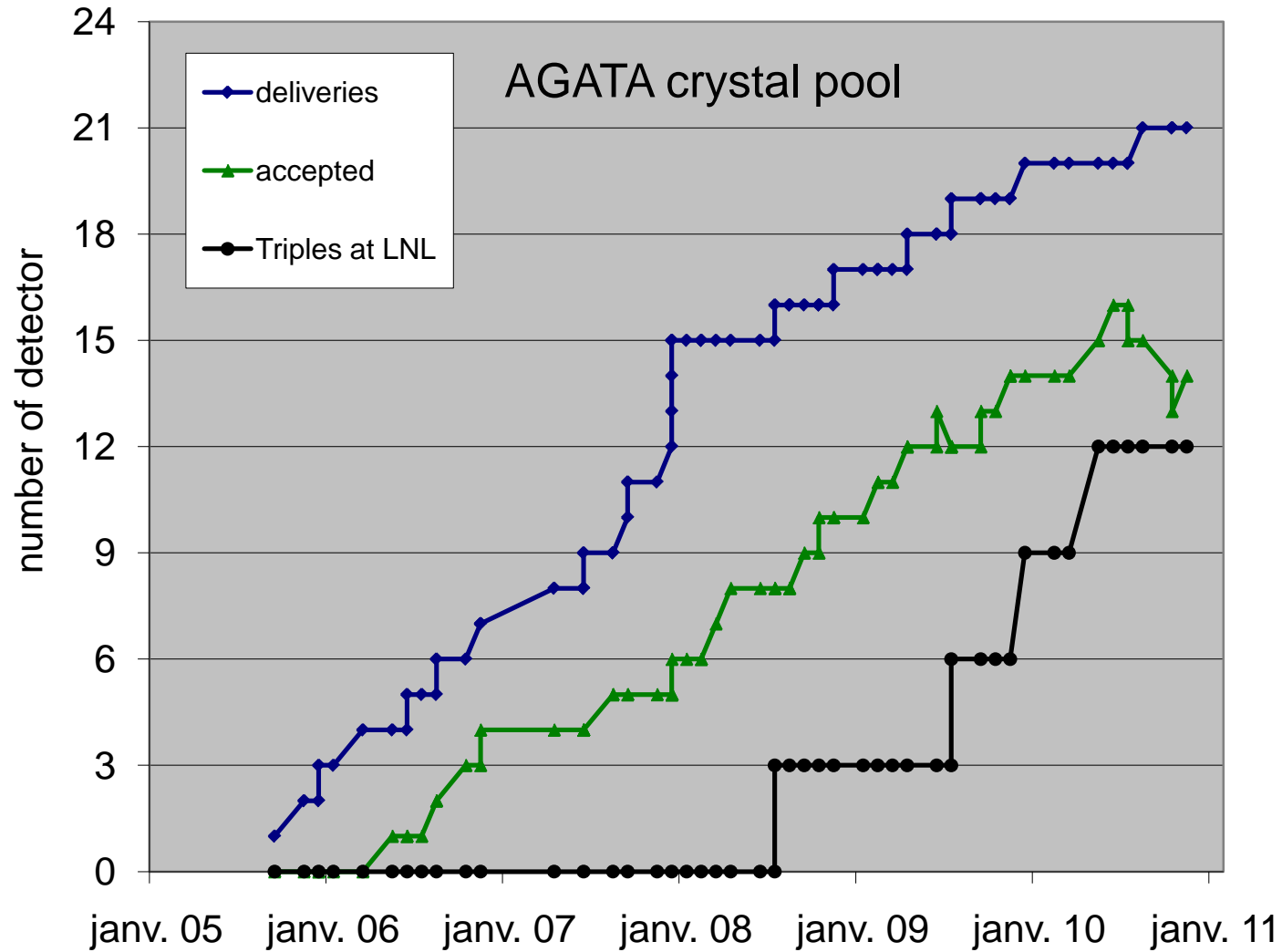
1 detector **A008** CAT pending

14 detectors **accepted and functional**:

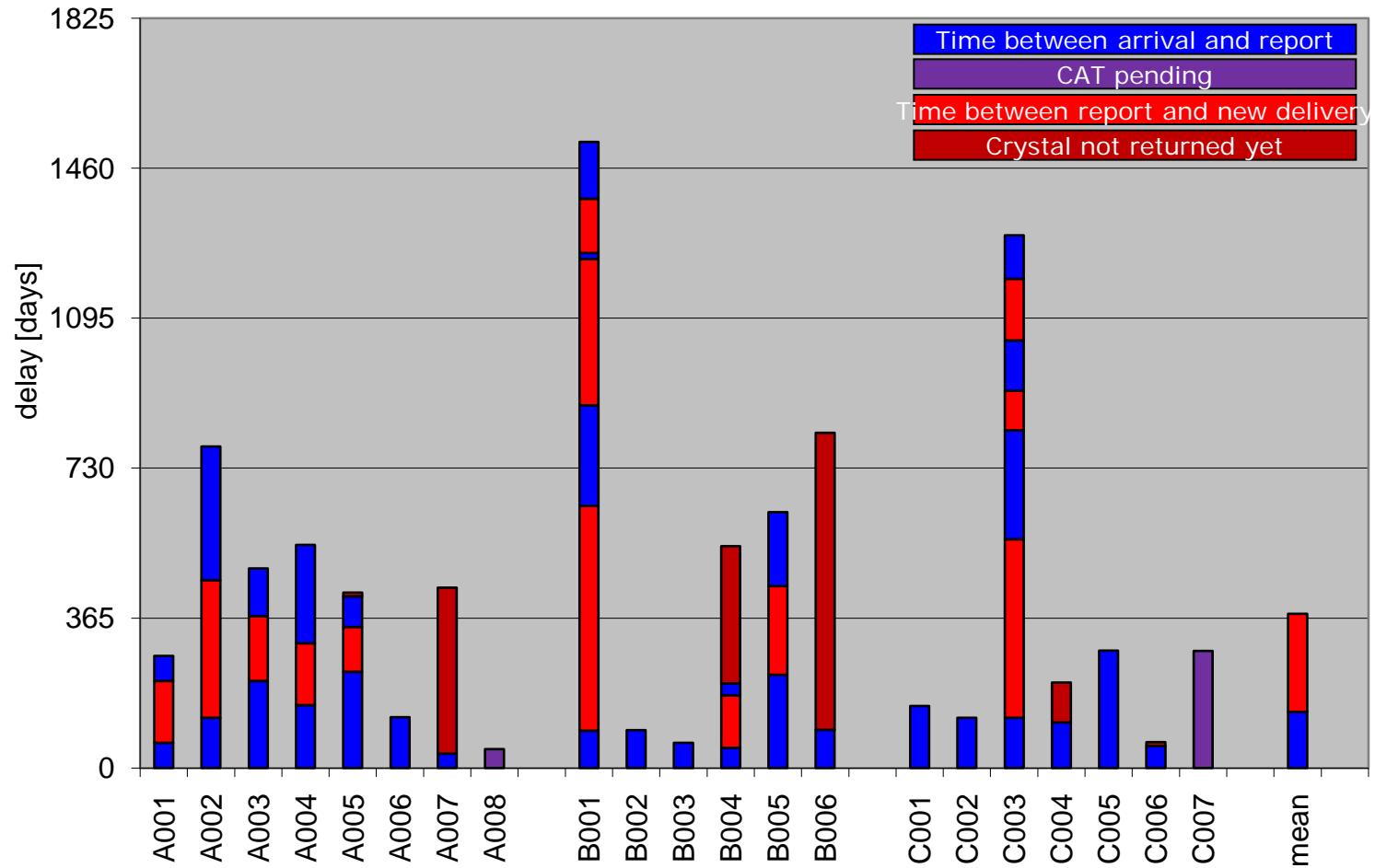
Usage of the available detectors in AGATA Triple Cluster:



AGATA crystals - evolution

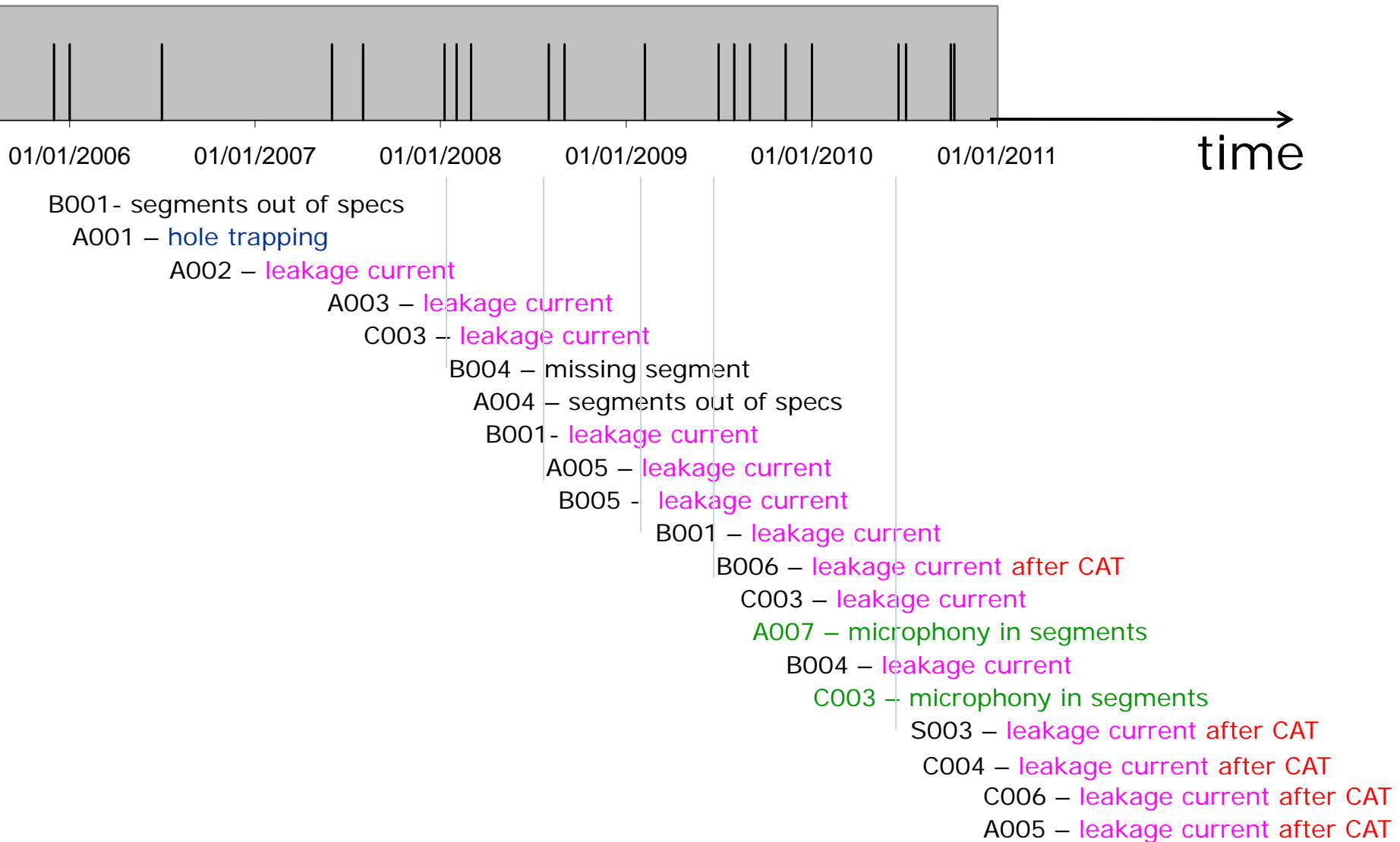


Crystals & delays



- Remark:
- Delay by shipment to Turkey taken out
 - Only time for repair and CAT is considered, the time crystals were in use is taken out

Crystals & Failures



AGATA detector deliveries

CANBERRA, Announced Deliveries, 29 April 2010

- A008 Jun 2010 Germany
- A007 July 2010 Italy
- B004 July 2010 Turkey warranty
- B006 Jun 2010 Italy warranty
- C003 July 2010 UK warranty
- B007 July 2010 Germany
- B008 Aug 2010 Germany
- C008 Aug 2010 UK
- A009 Oct 2010 UK
- B009 Dec2010 UK

Last Deliveries

- A008 25. August 2010 Germany
- C003 5. July 2010 UK warranty

- seven detectors behind schedule.

- missing B-type detector.

- Future Delivery

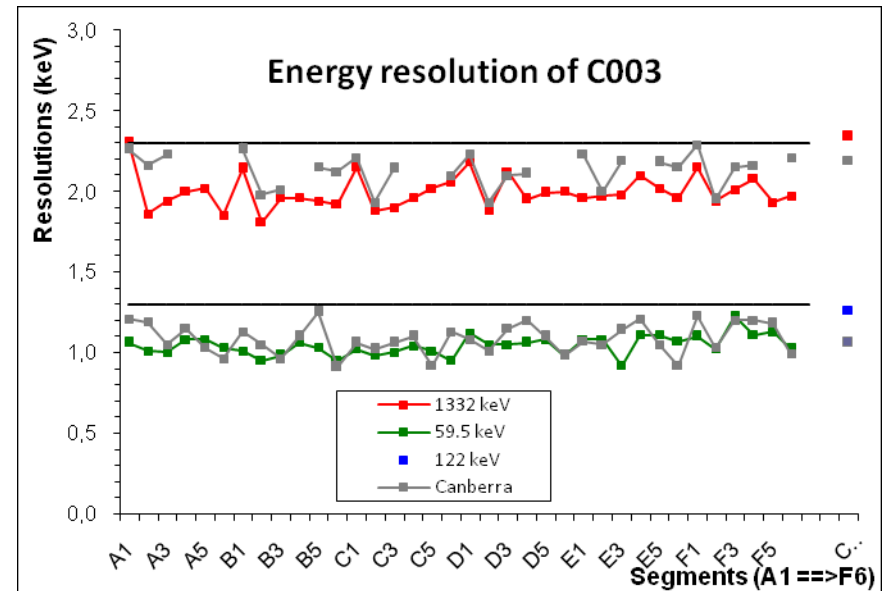
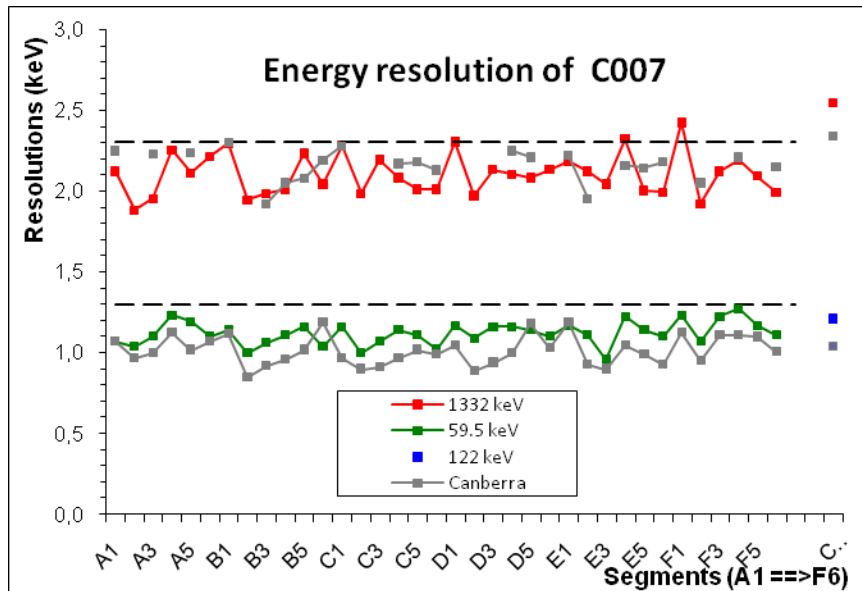
- A009 December 2010 UK

Status acceptance tests

A008 @ Liverpool

The detector lab in Saclay

- **Team involved:** Marie-Delphine Salsac, Marc Karolak and Mariam Kebbiri
- **Work done in 2010:**
 - Acceptance test of C007 and C003



- Travelling to Cologne to learn how to mount and repair a triplet
- **Work to be done in 2011:**

- Continue the acceptance tests of crystals
- Mount and test triplets or multiplets
- Maybe repair the unworking triplets

Status future Cluster detectors

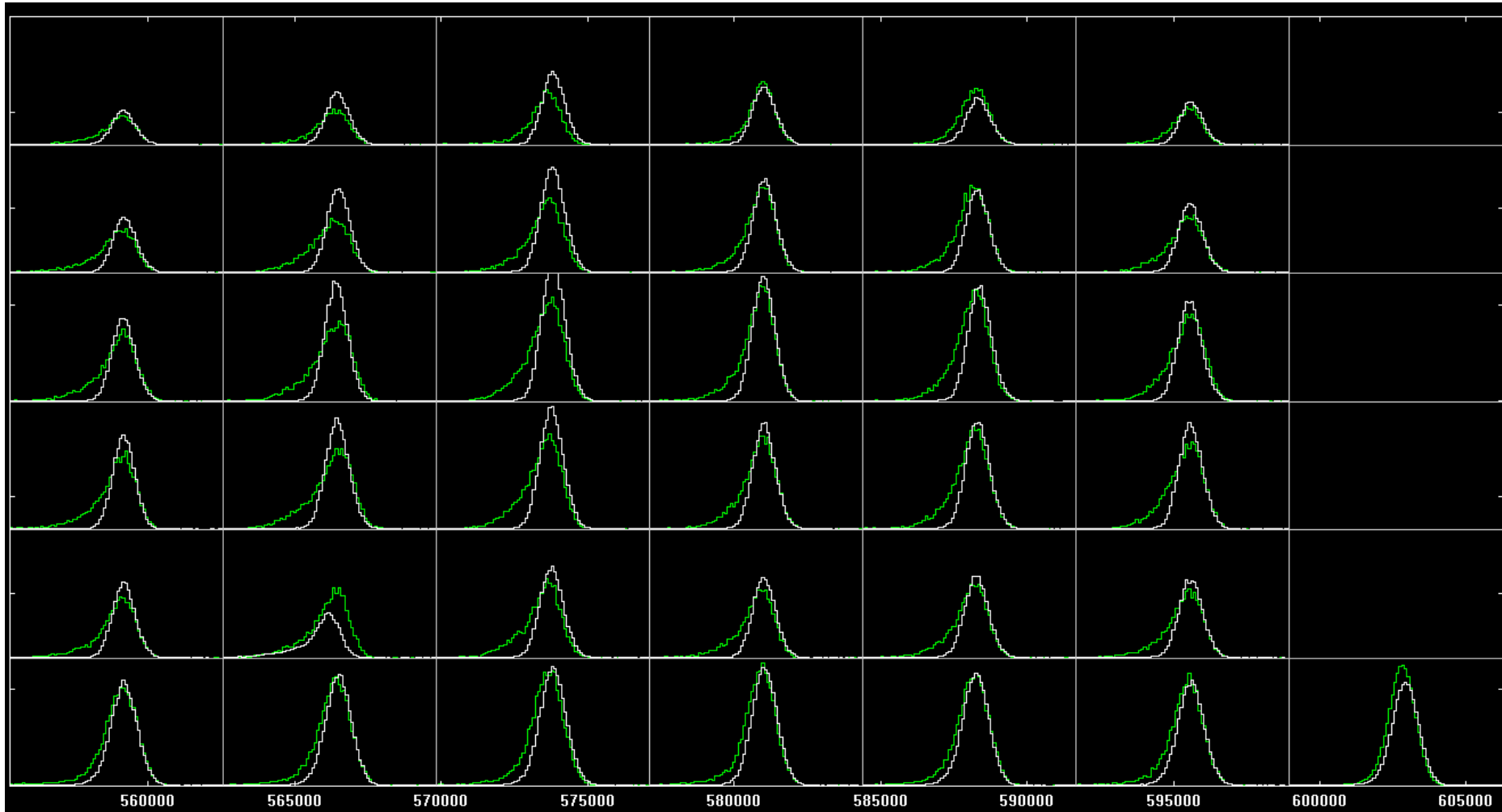
- ATC5: A005 and C007 mounted, waiting for B-crystal, at IKP
- ATC6 at IKP,
- ATC7, ATC8 at CTT

Summary of ordered cryostats and end caps

- 5 ATC's from demonstrator,
- 3 ATC's (2 Italy, 1 Germany) ready for detectors
- 1 AdoubleC (UK)

- 1 double end cap (Saclay)
- 1 double end cap (GSI)

Det. 1B - Shape of the 1332 keV line



A

B

C

D

E

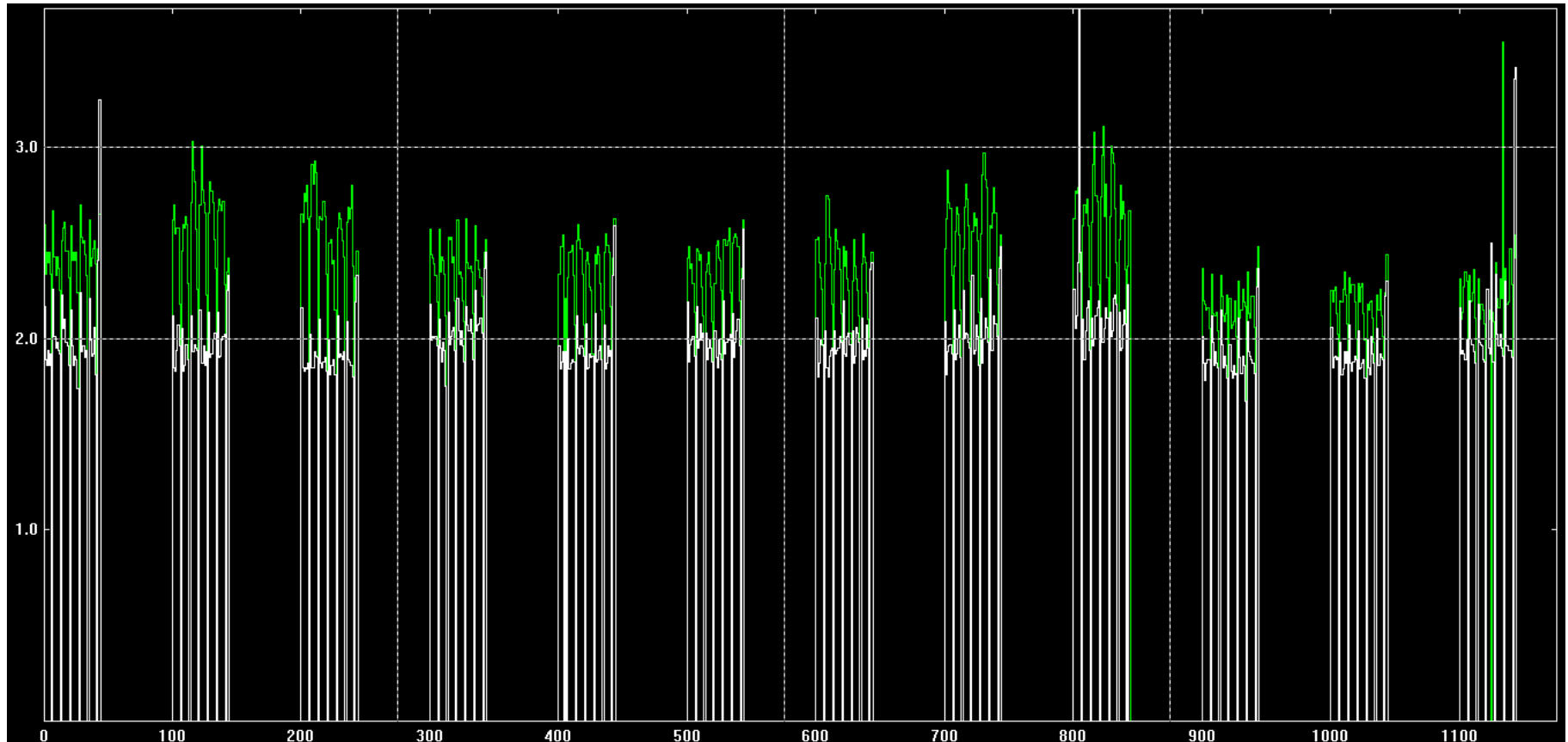
F

CC

/150

Talk by B. Bruyneel

Neutron damage of AGATA clusters



Segment energy resolution values of ATC1 – ATC4

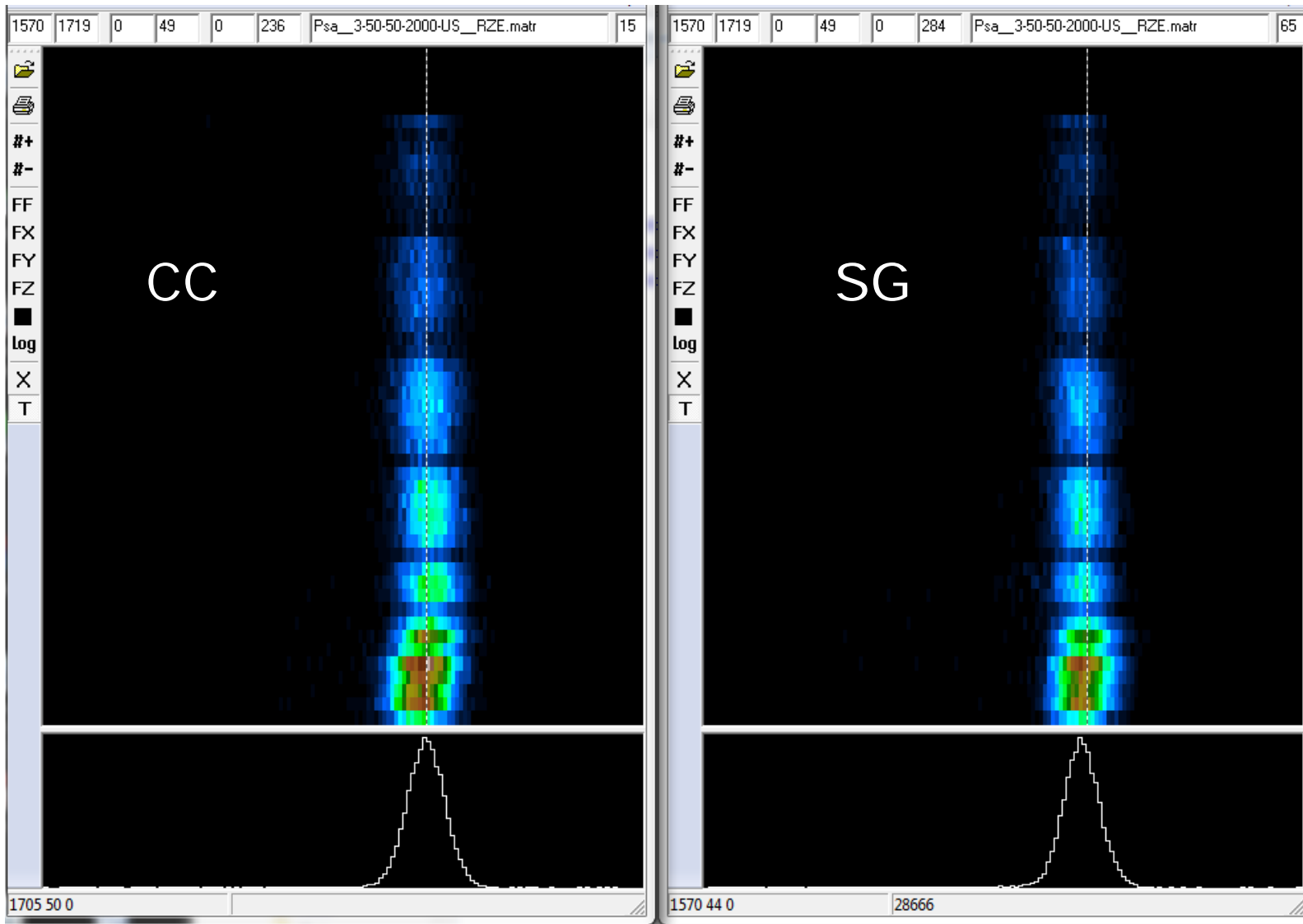
White: April 2010

Green: July 2010, after 3 high-rate experiments (3 weeks of beam at 30-80 kHz singles)

Worsening more severe on the forward crystals

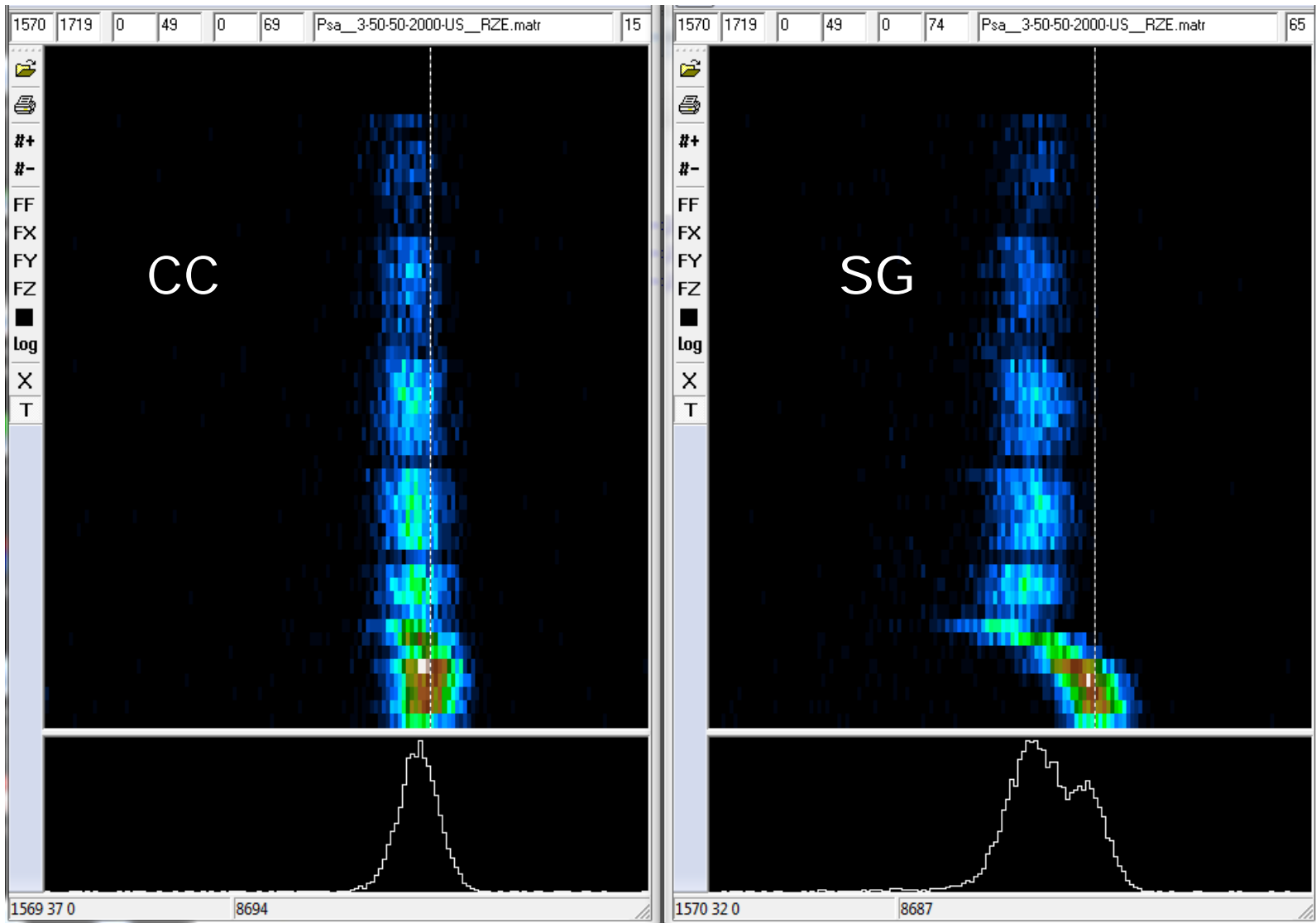
Segments are the most affected, cores almost unchanged

1B April 2010



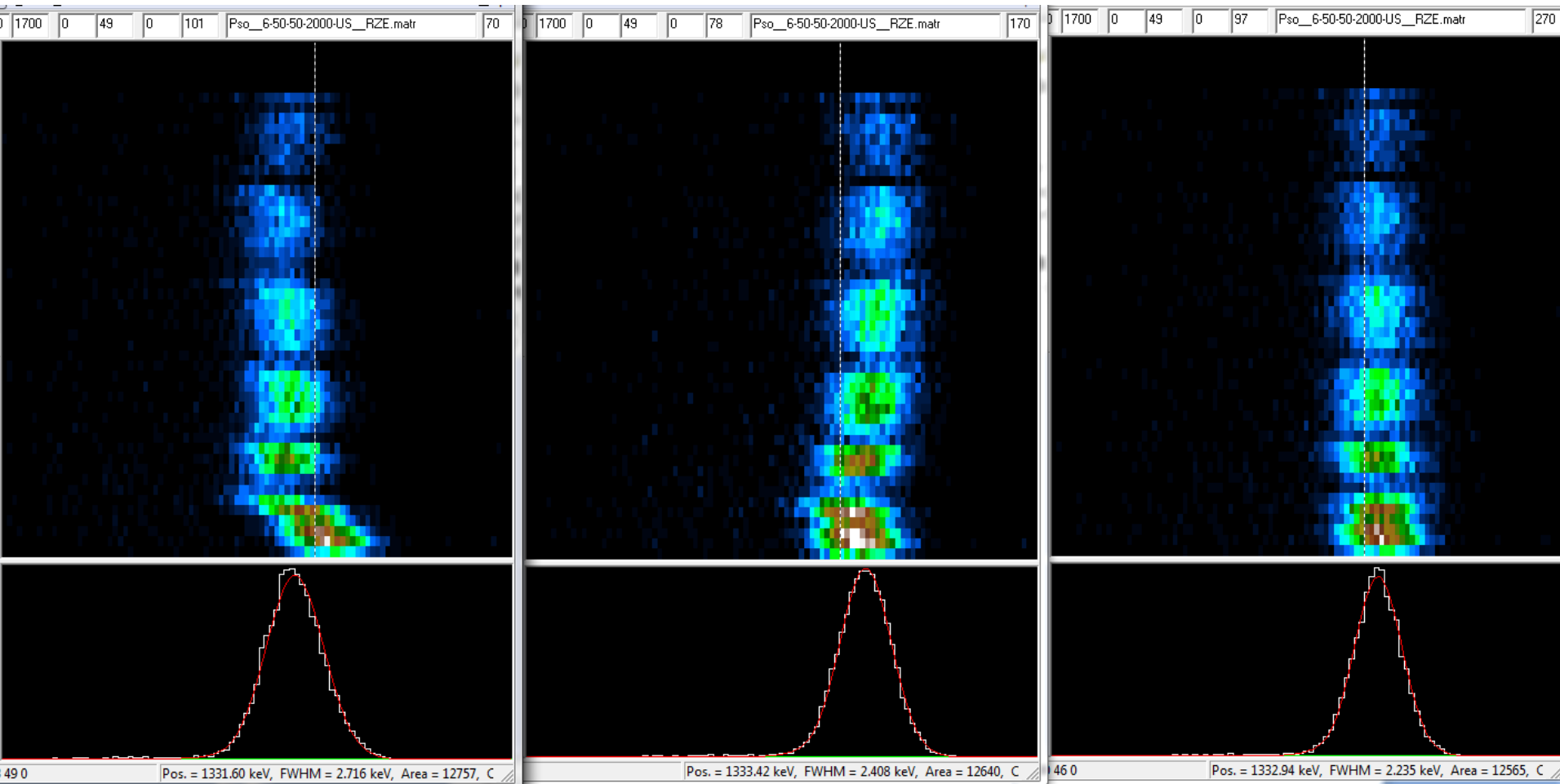
The 1332 keV peak as a function of crystal depth (z) for interactions at r=15mm

1B July 2010



The 1332 keV peak as a function of crystal depth (z) for interactions at r=15mm
Position of the hits derived from the GRID search PSA

Segments, 1B(C002), r=20 mm



Position dependent neutron damage correction works!

Maintenance of AGATA clusters at LNL

Scheduled Maintenance at Legnaro 13. – 23. September

ATC2

replacement of wires in cold part,
repair of one missing segment cable

ATC3

increased temperature

Unscheduled Maintenance after 23. September

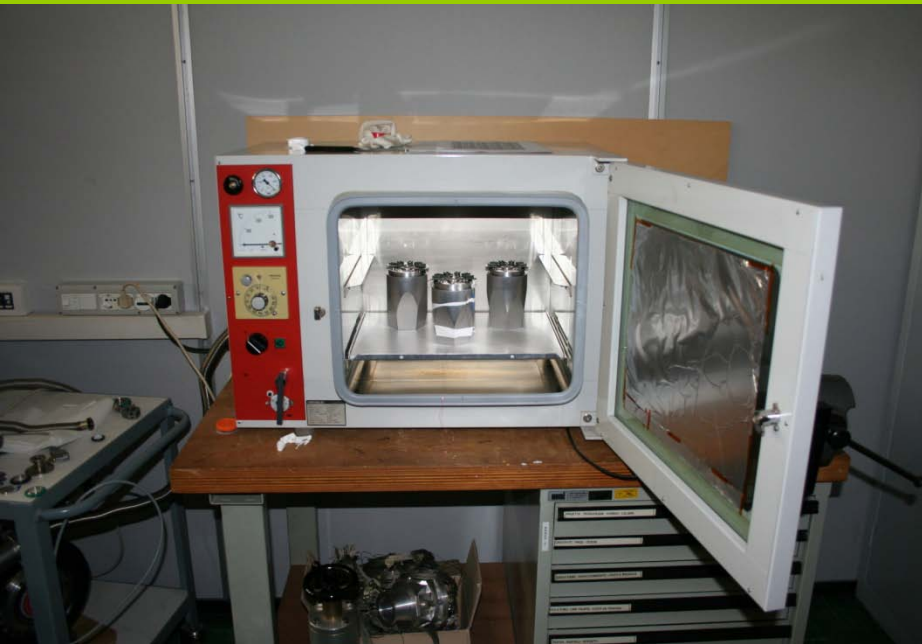
ATC1

ATC4



First annealing of AGATA capsules!

Annealing of AGATA clusters at LNL

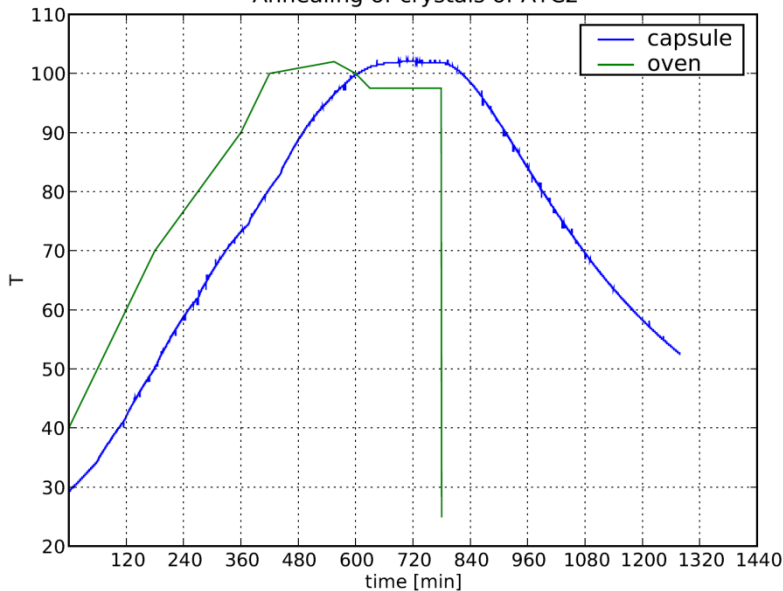


AGATA needs an annealing station

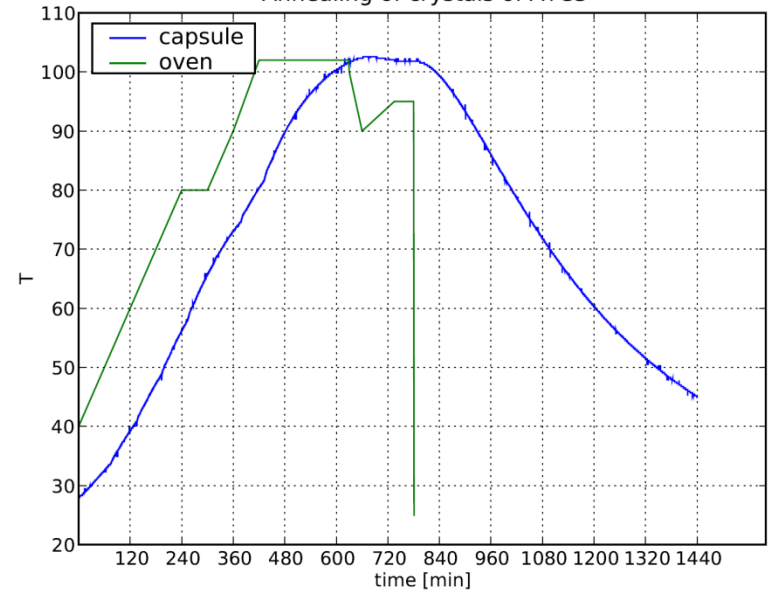


C003 broken after annealing

Annealing of crystals of ATC2



Annealing of crystals of ATC3



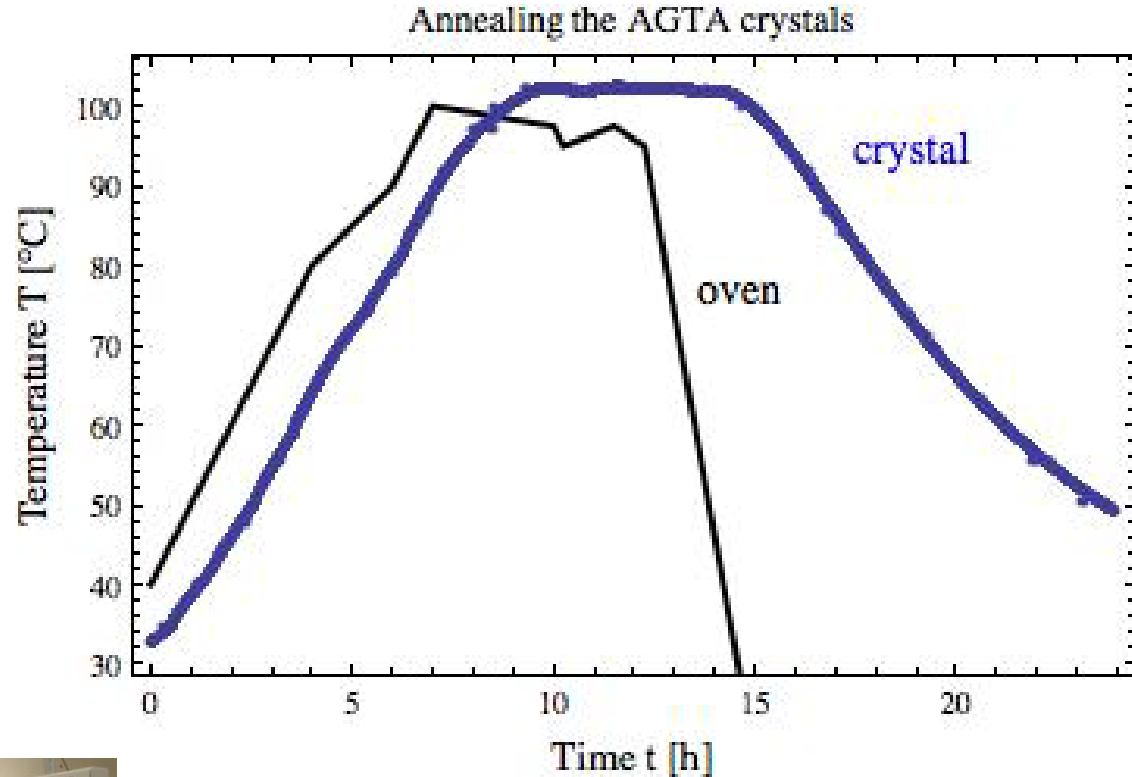
Transport of ATC(1), ATC(4) to IKP, Cologne

- Dismounting of crystals: A001, B002, C002, A005, B001 and C001 @ Legnaro
- Broken capsule C003 of ATC(3) replaced by C001 of ATC(4)
- Ongoing repair campaign at IKP, Cologne
M.-D. Salsac, M. Karolak, M. Kebbiri (CEA, Saclay)
Marc Norman, Tom Stainos (University of Liverpool)
D. Lersch, H. Hess, A. Wiens, B. Birkenbach (Cologne)

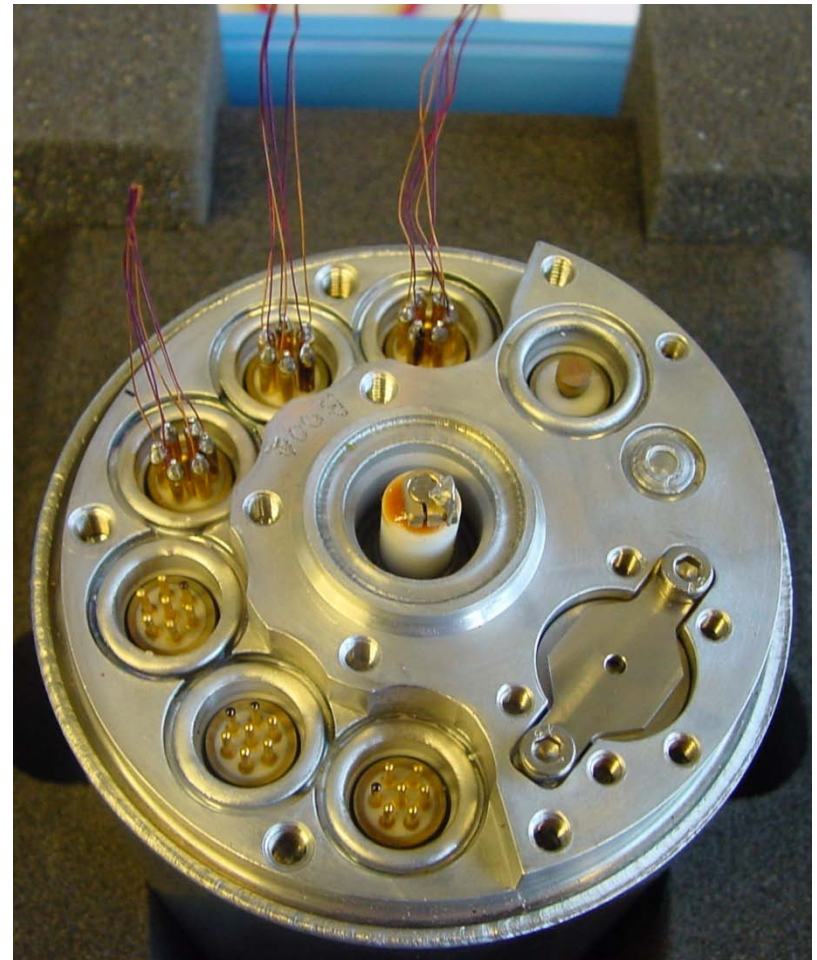
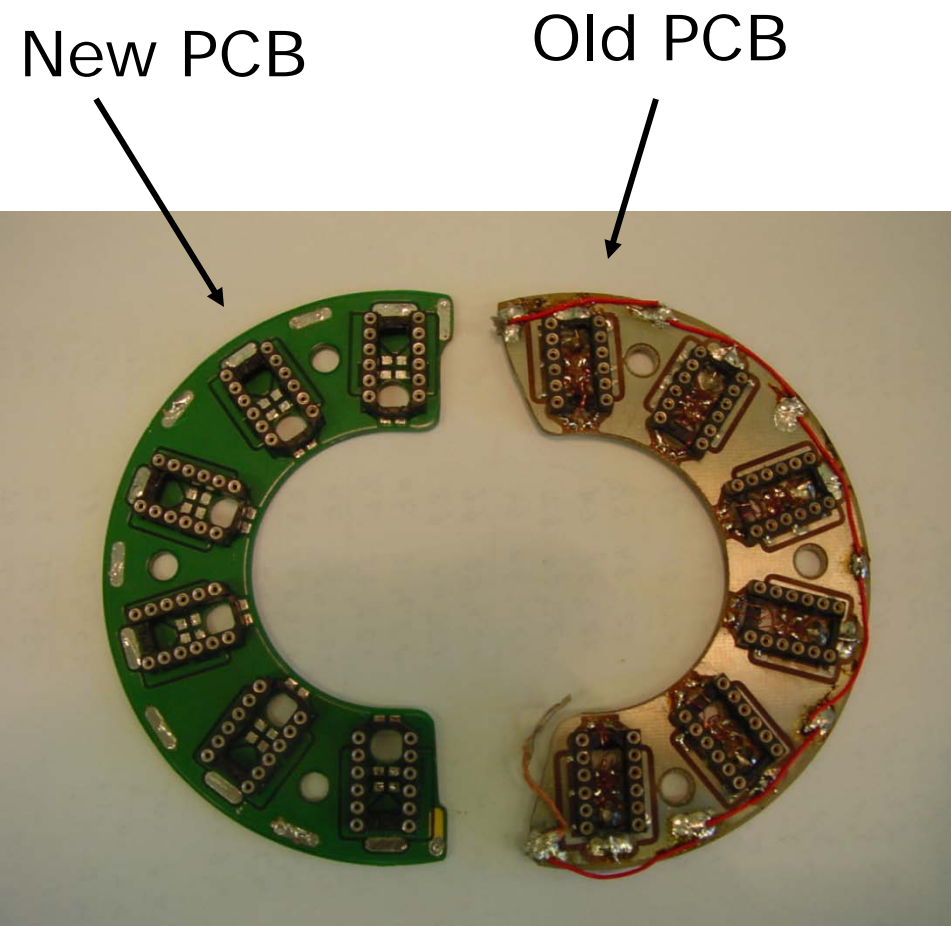


1. Annealing of crystals

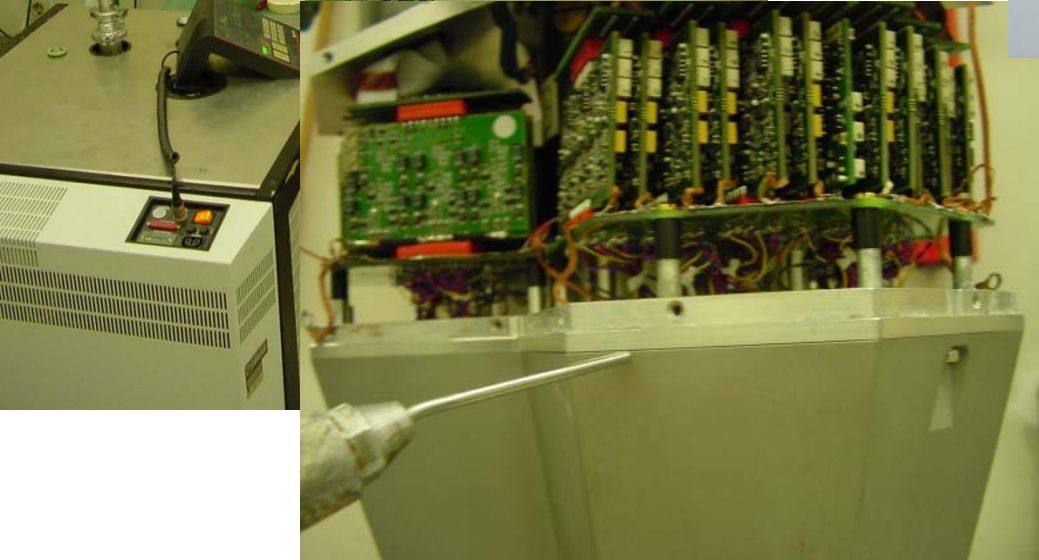
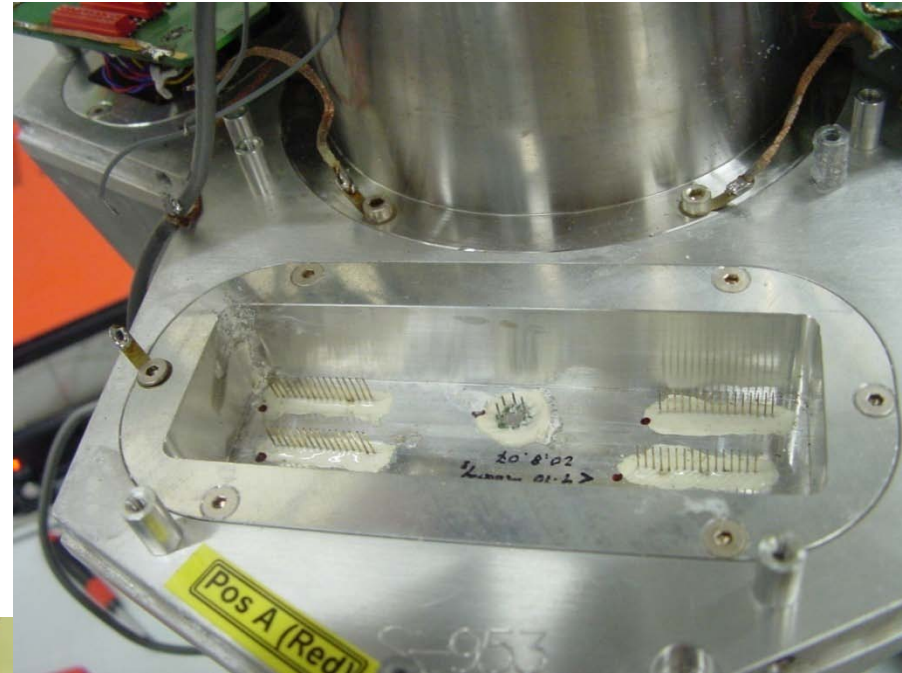
- Annealing of crystals
A001, B002, C002, B001
- Increased annealing
time: 5h @ 102°C



2. Exchange of cold PCB



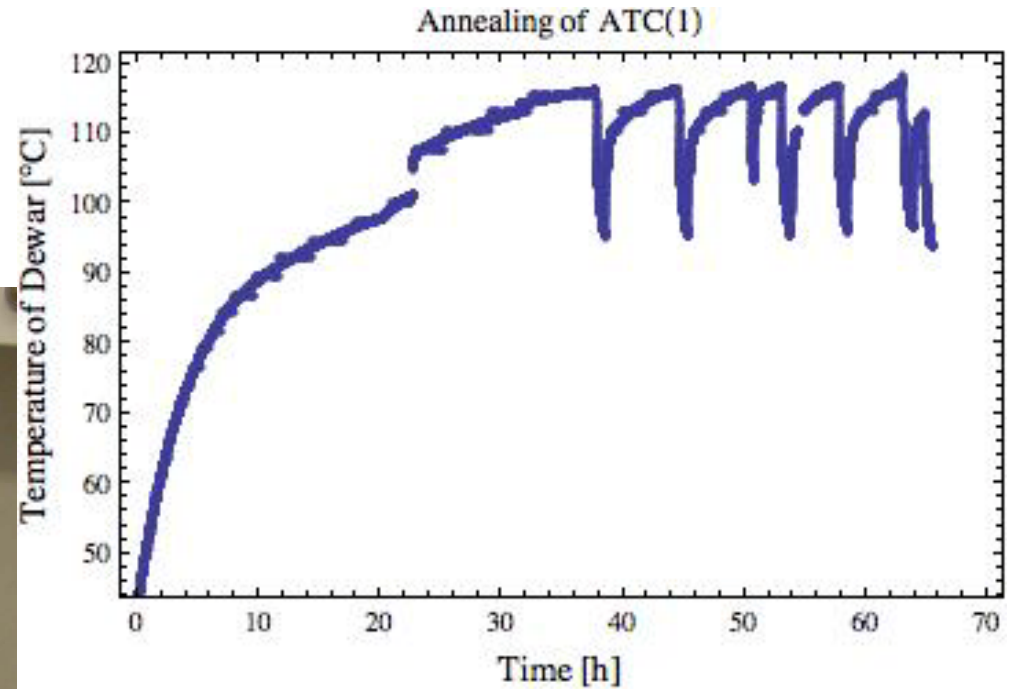
3. Leak-Test of ATC-Cryostats



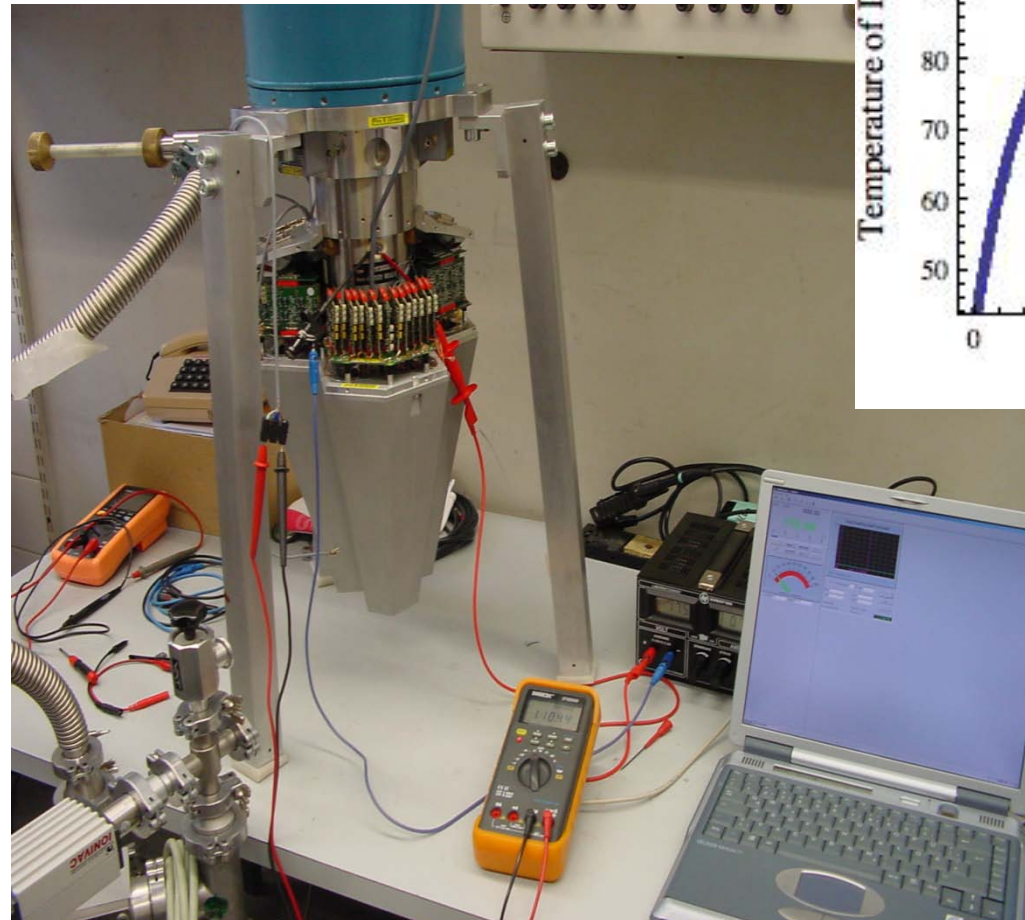
ATC(4): vacuum o.k.

ATC(1): broken vacuum feed throughs
⇒ replacement, new flanges

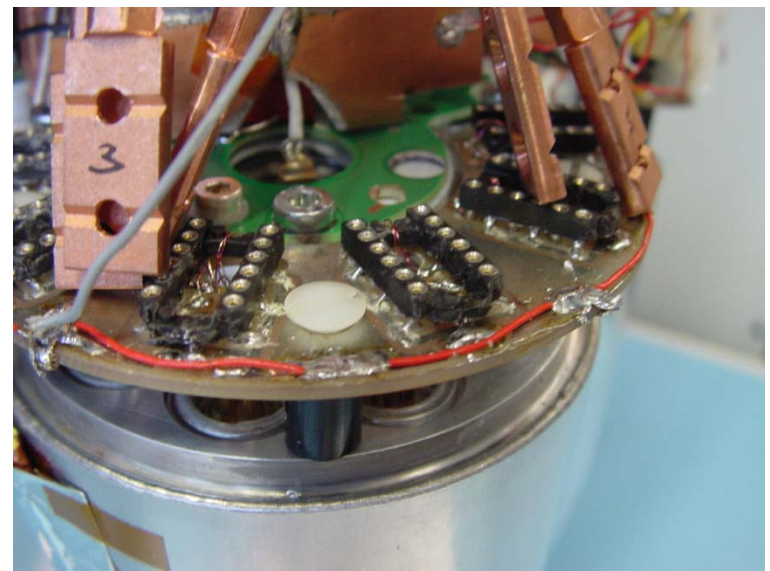
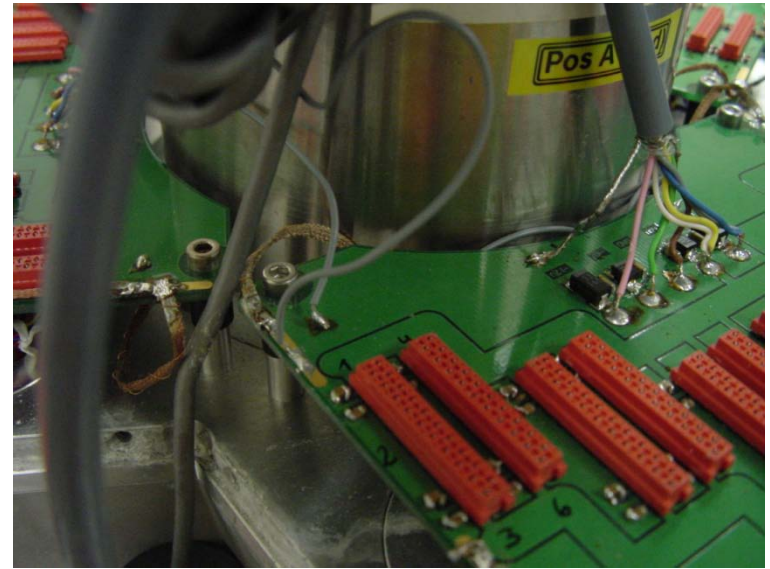
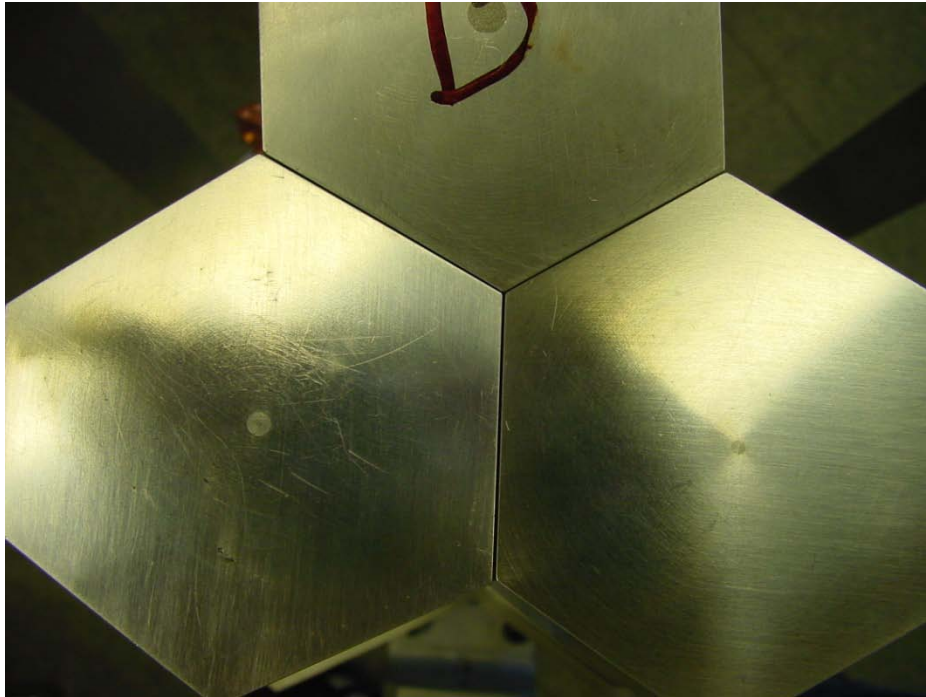
4. Annealing of ATC-cryostats



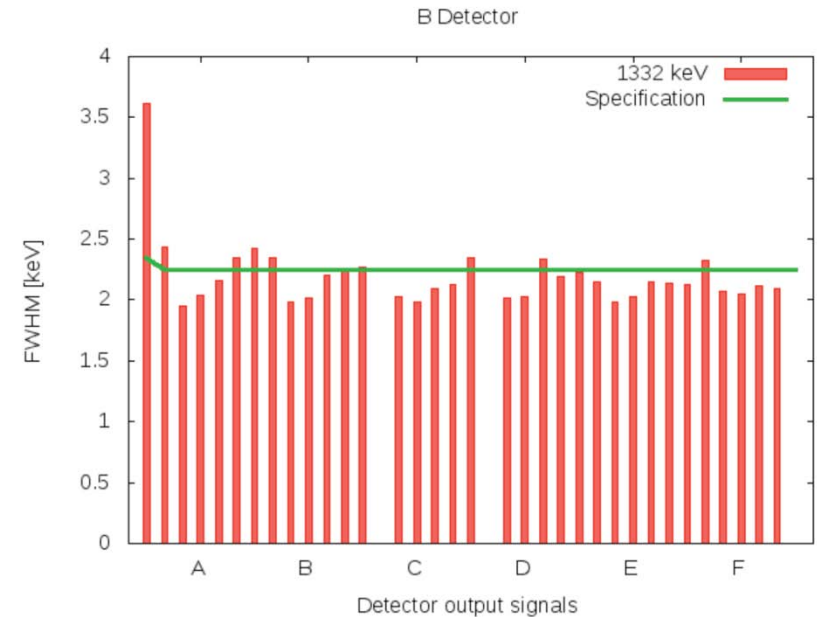
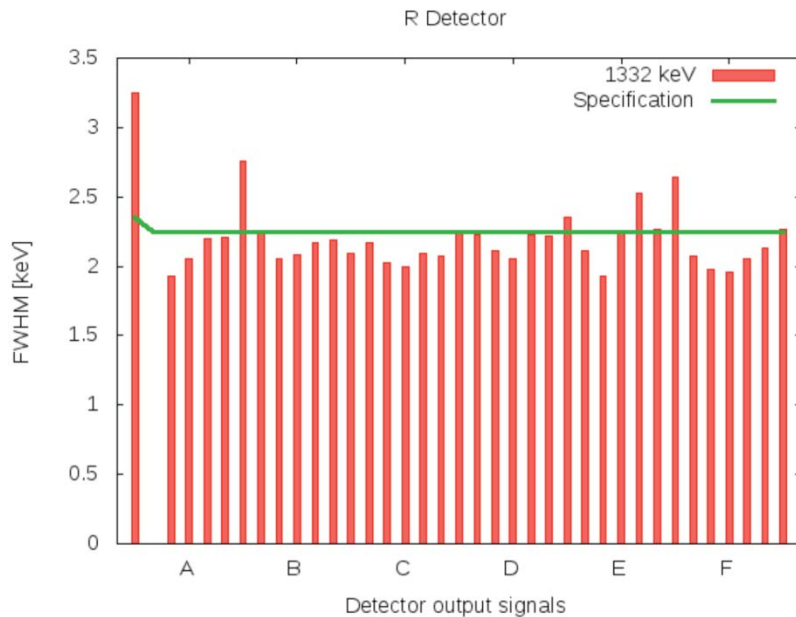
- heat power $\sim 20\text{W}$
- Max. temp. $\sim 110^\circ\text{C}$ for several days



5. Reassembly of crystals, cold and warm electronics



6. Final test of detectors



Example ATC5

-energy resolution at 1.3 MeV of detector A and C

All segment signals of ATC1, ATC4, ATC5 o.k.

Some cores need improvement

Transport of detectors to LNL beginning of December