
Report from the AGATA detector lab at Saclay

Magda Zielińska for the IRFU detector team:

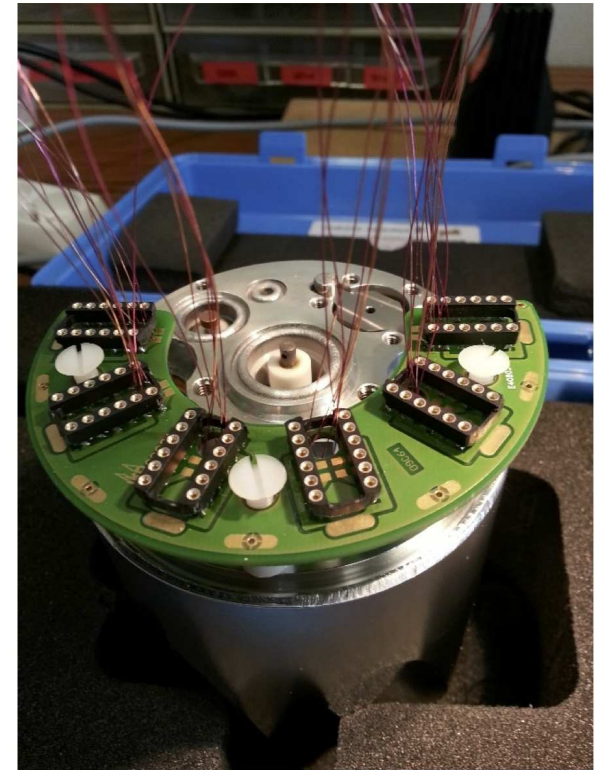
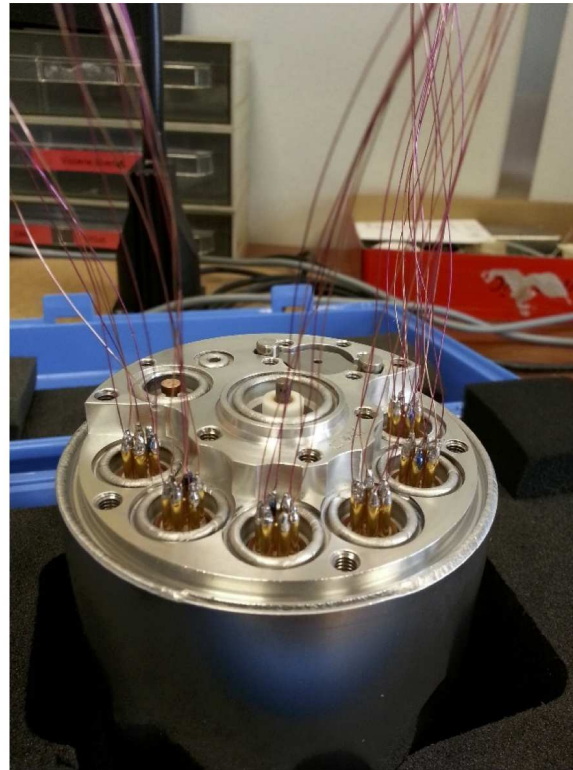
M. Karolak, M. Kebbiri, M. Komorowska, Ch. Theisen, MZ

AGATA capsules tested in the Saclay lab

- 2007-2013: 13 capsules (~2 per year)
 - 2015: C012 (started in 2014), C014, B014 (finished in 2016)
 - 2016: A011, C002 (after repair), A012
 - 2017 : A008, B001, C001 (after annealing), C013 (faulty at Ganil)
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- B014: received November 24, 2015, report January 22, 2016
 - A011 received March 21, 2016, report April 15, 2016
 - C002 received May 10, 2016, report June 16, 2016
 - A012 received July 26, 2016, report September 15, 2016
 - A008 and B001 received January 11, 2017, report March 28, 2017
 - C013 received March 24, 2017, test finished May 4, 2017
 - C001 received July 12, 2017, report July 28, 2017

Preparation of a CAT

- mounting of the PCB, mounting in a cryostat, pumping, cooling down: about a week
- ramping HV up: one day
- all signals present after cooling down in at least last 10 procedures



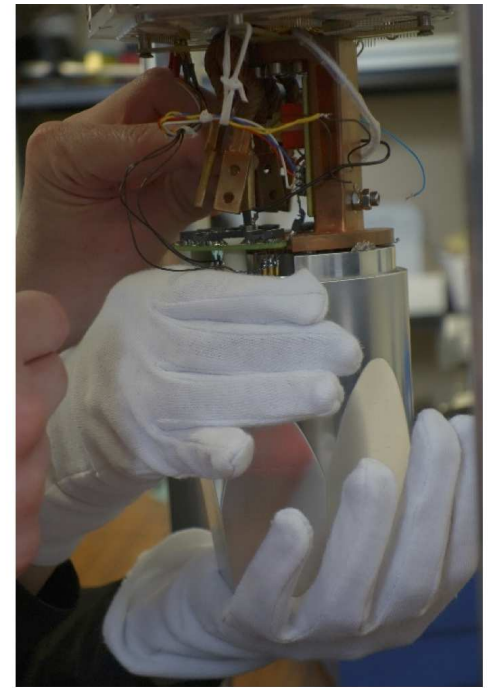
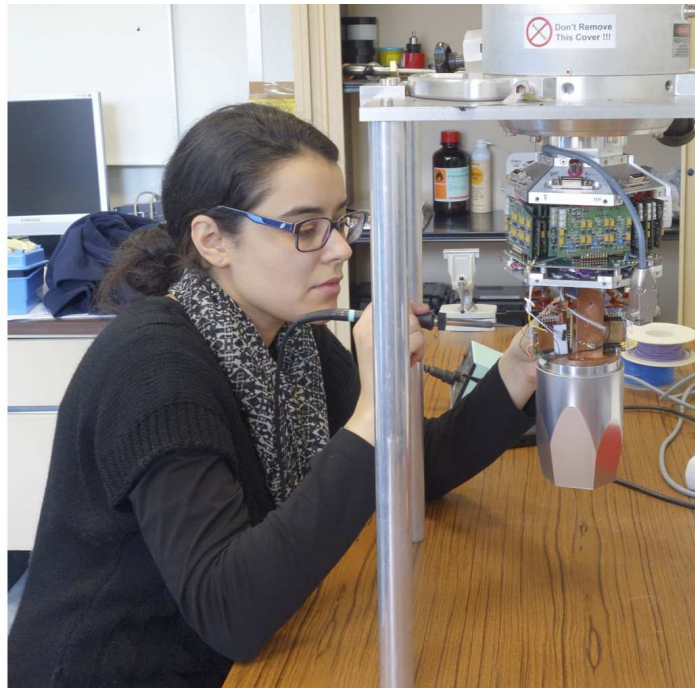
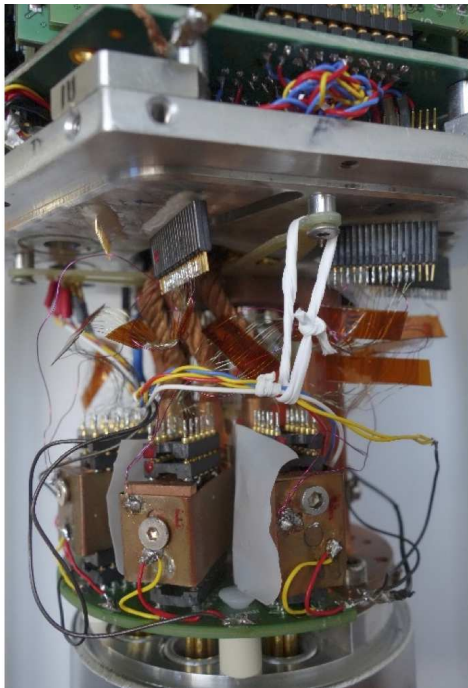
Recent upgrades of the lab

- new multi-channel analyser: we passed from 3 to 6 channels (end 2016)
- new ^{60}Co (end 2016) and ^{57}Co sources (2017)
- one new spectroscopic amplifier (Ortec 671) – May 2017

- now possible to cool down a detector on Monday and make all tests by the end of the week:
 - resolution at 59 keV/122 keV and 1.3 MeV
 - efficiency (not required in a CAT but useful for the performance group)
 - cross talk (also not required and thus skipped if we need to deliver the capsule quickly)

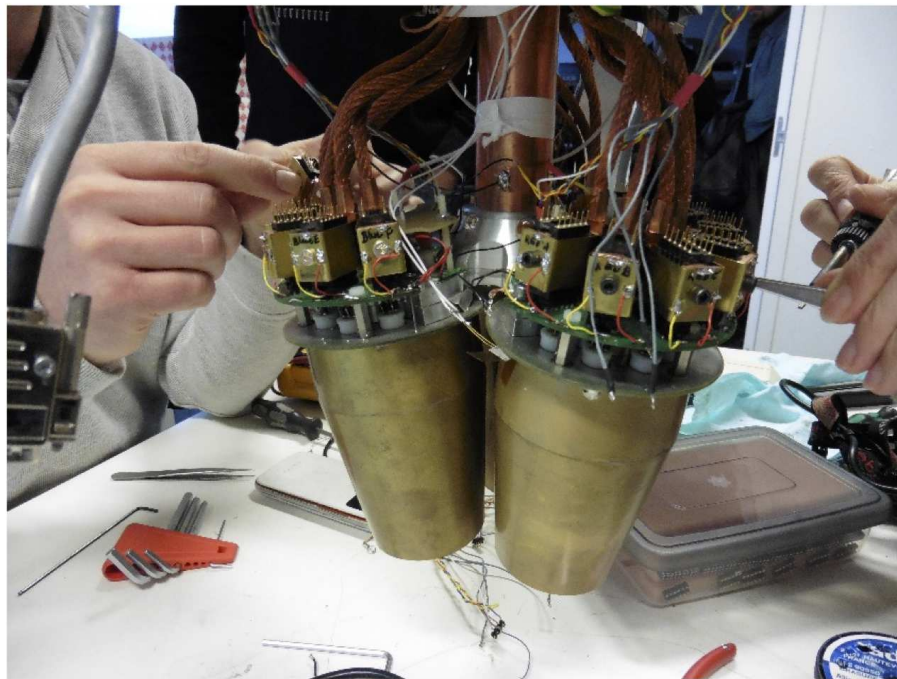
After a CAT

- warming up and dismounting (2-3 days)
- analysis of cross-talk data (few days)
- transport to GANIL/IKP/Lingholsheim



Participation in maintenance of ATC's at GANIL

- several members of the Saclay team participated in ATC maintenance together with GANIL and IPHC teams and under direction of Herbert
 - changes of FETs and internal cabling
 - tests with electronic dummies
 - replacing of feedthroughs
 - annealing

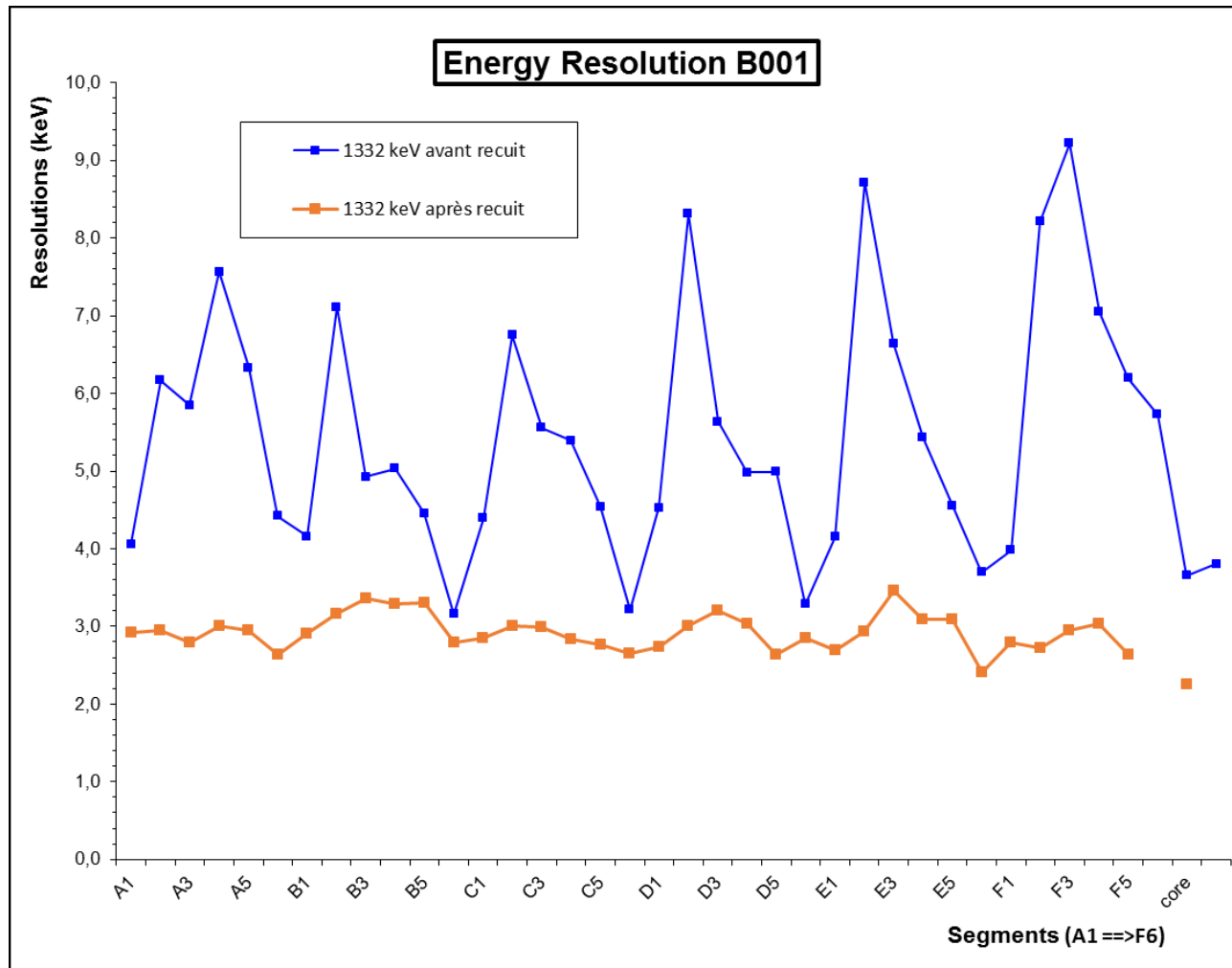


Tests of C013

- capsule mounted in ATC9; recurrent failures of core FET observed at GANIL
- March 2017: C013 arrives at Saclay
- April 2017: core FET broken at 2500V
- May 2017: after cleaning the contacts and changing the FET, it breaks again at 3050V
- vacuum problem suspected
- delivered to Mirion Lingholsheim on July 19, 2017
- Mirion confirmed vacuum leaks on several segment feedthroughs

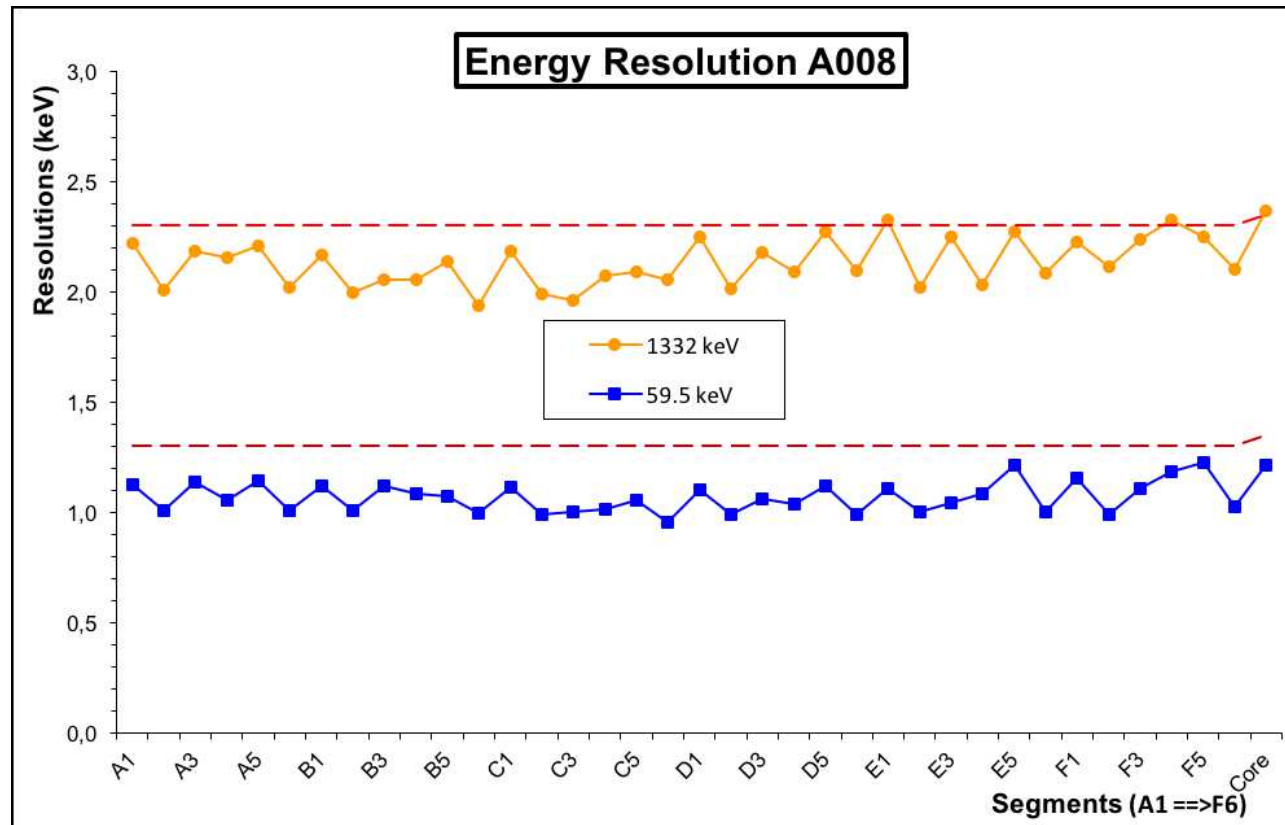
Tests of capsules following annealing: B001

- significantly improved performance after the annealing procedure
- segment F6 missing due to bad contact on the feedthrough (thick layer of glue applied to eliminate a vacuum leak; FIXED)



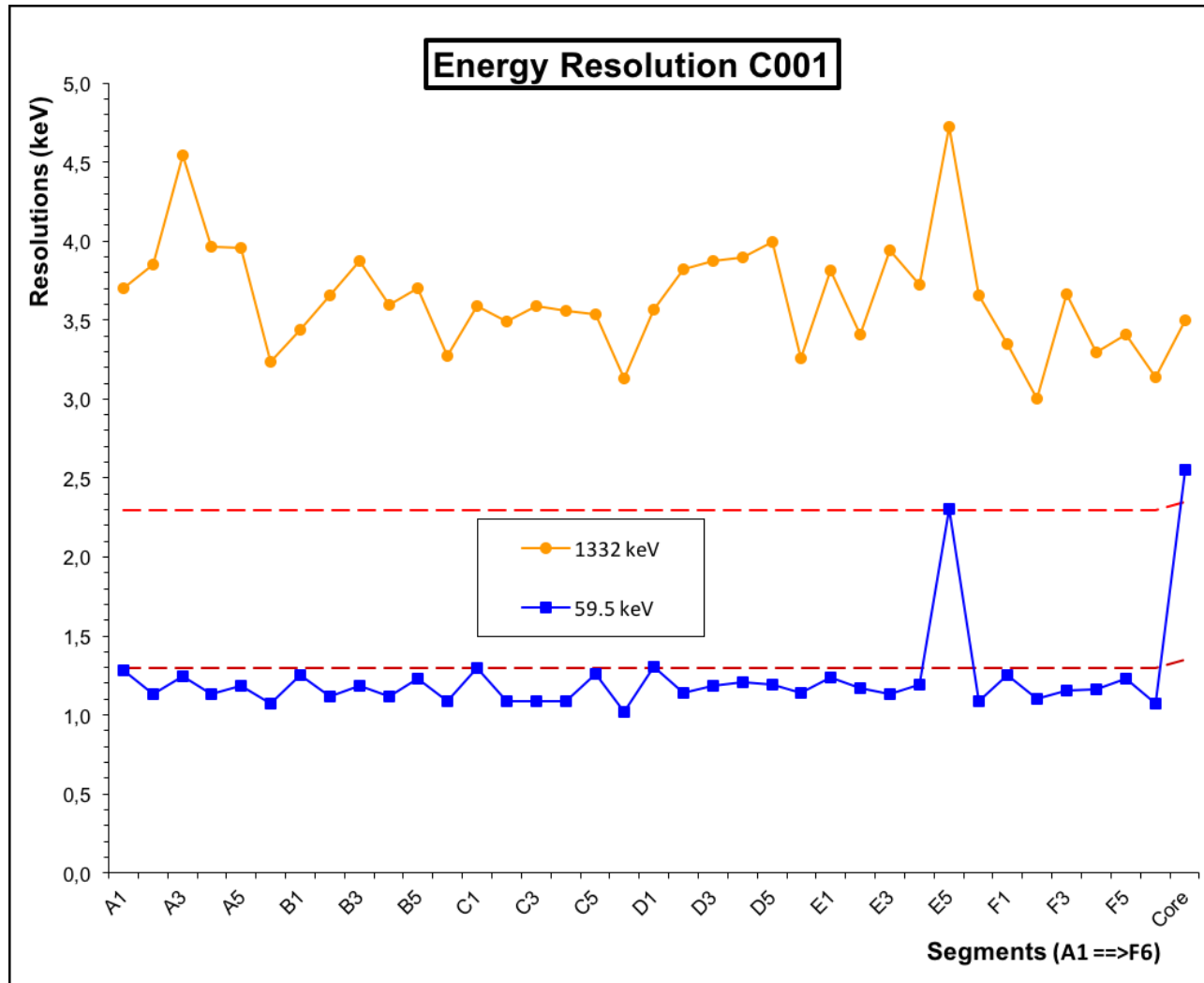
Tests of capsules following annealing: A008

- excellent performance after annealing: standard CAT requirements fulfilled



Tests of capsules following annealing: C001

- leakage current in segment E5
- detector still at Saclay – what next???



Open questions

- next tests at Saclay – when?
- future involvement in triplet maintenance and repair?
- tests of DEGAS capsules?