

Status of AGATA Detectors and Cryostats

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Status of AGATA Detectors and Cryostats

Overview

- Status at the end of physics campaign 2018
- Activities on capsules since last AGATA week
- Maintenance of AGATA Triple Cryostats
- Summary & Outlook

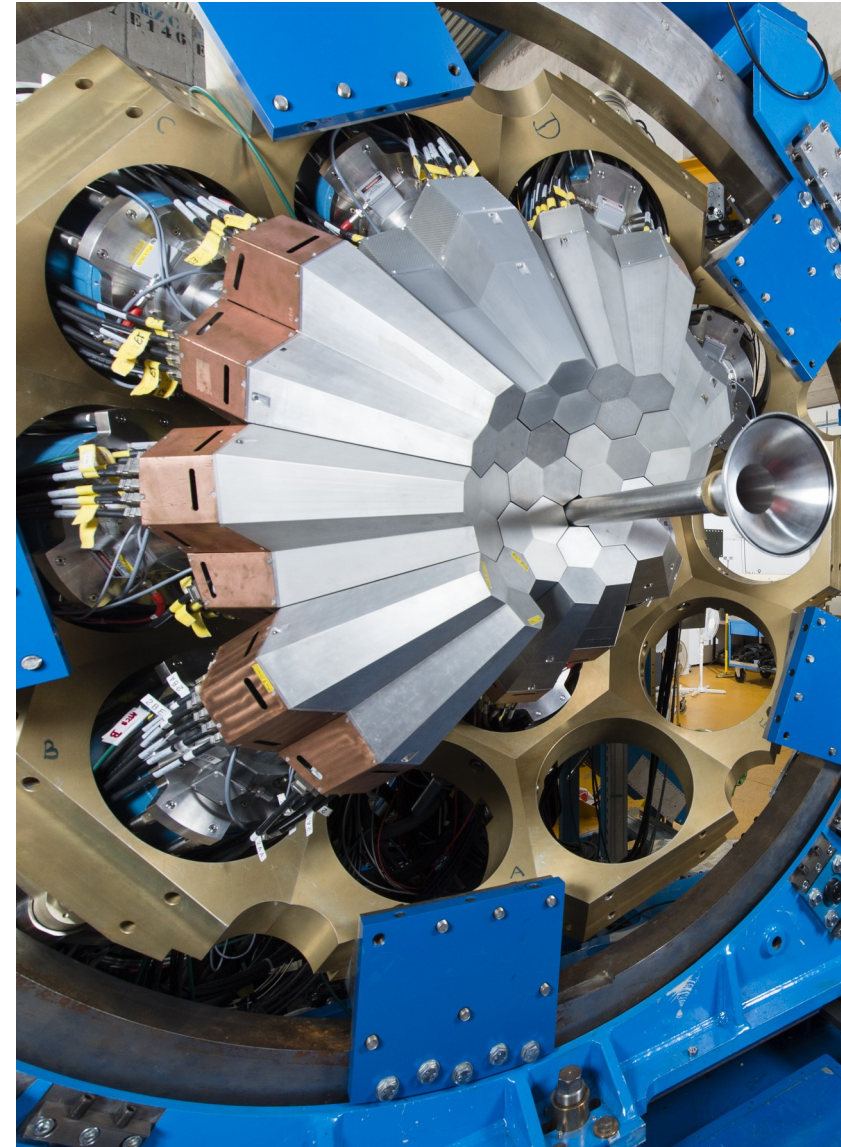


Detectors at GANIL, end of the physics campaign 2018

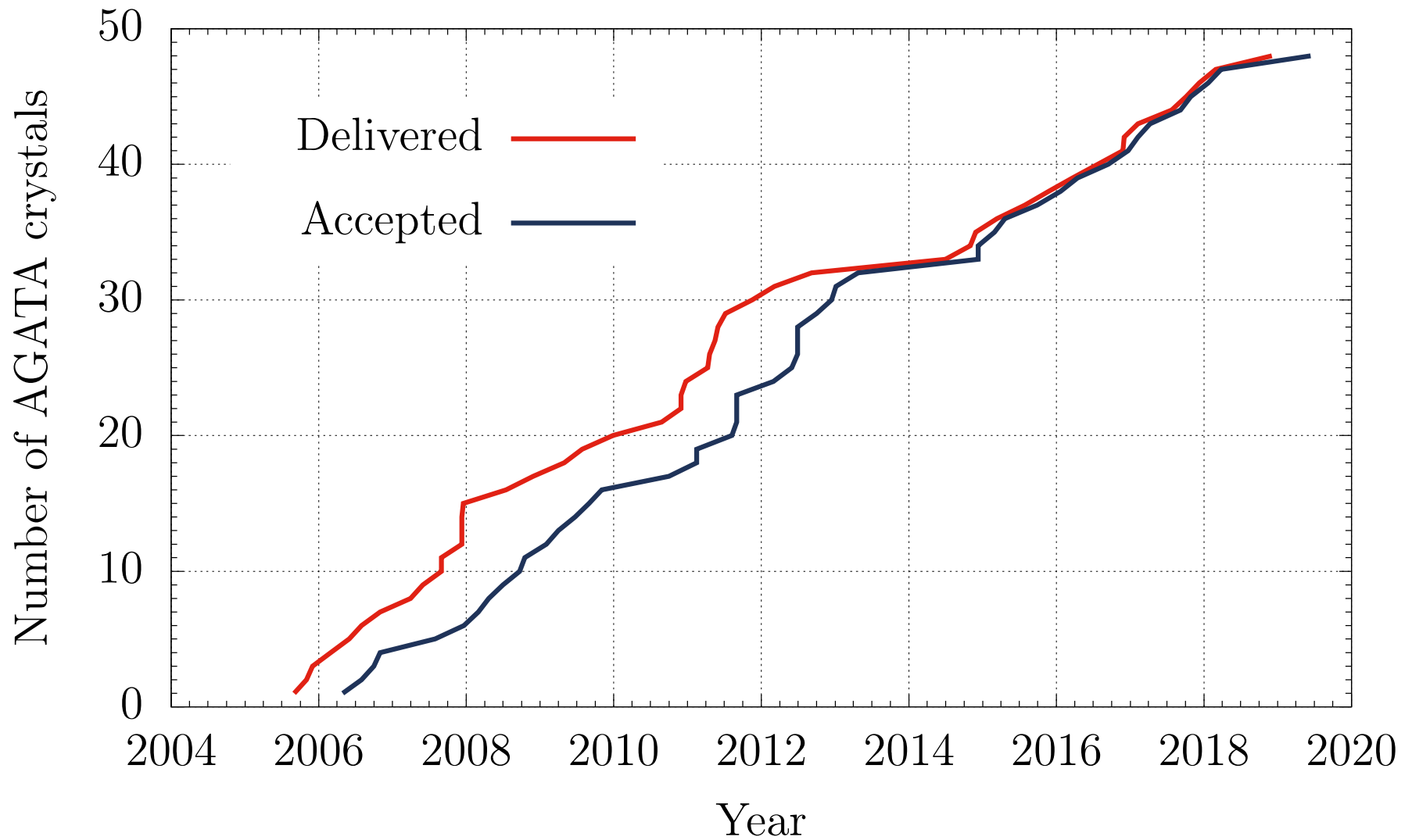
35 detectors with all 1295 channels in operation at GANIL for the physics campaign

ATC01: A012, B001, C004
ATC02: A003, B003, C005
ATC04: A007, B007, C007
ATC05: A008, B002, C009
ATC06: A001, B004, C010
ATC07: A006, B013, C006
ATC08: A009, B005, C008
ATC09: A004, B008, C002
ATC11: A011, B006, C012
ATC12: A013, B014, C015
ATC13: A014, B016, C016

ADC03: - B011, C011



Status Capsules



Activities on Capsules since last AGATA week



detector	Mirion	delivery	accepted	tested by
A005	repair	July 2018	October 2018	Univ. of Liverpool
B009	repair	September 2018	October 2018	Univ. of Liverpool
B014	repair	October 2018	November 2018	CEA Saclay
B010	repair	December 2018	December 2018	FAT, IKP
C013	repair	February 2019	February 2019	FAT, IKP
A016	new detector	March 2019	failed	IPHC Strasbourg
A016	repair	June 2019	June 2019	FAT, IPHC
A501	repair	February 2019	February 2019	FAT, IKP & IPHC



FAT of B010 (new encapsulation)

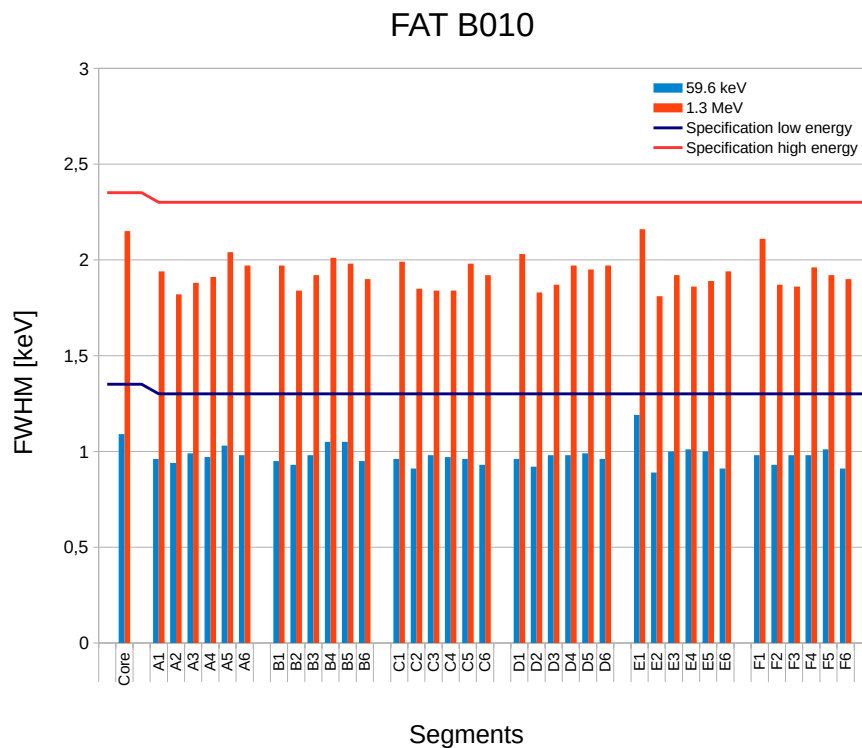
FWHM B010:

@ ^{241}Am : Core 1.09 keV

Segment average 0.974 keV

@ ^{60}Co : Core 2.15 keV

Segment average 1.929 keV



FAT of A501 (DEGAS) & C013 (new encapsulation)

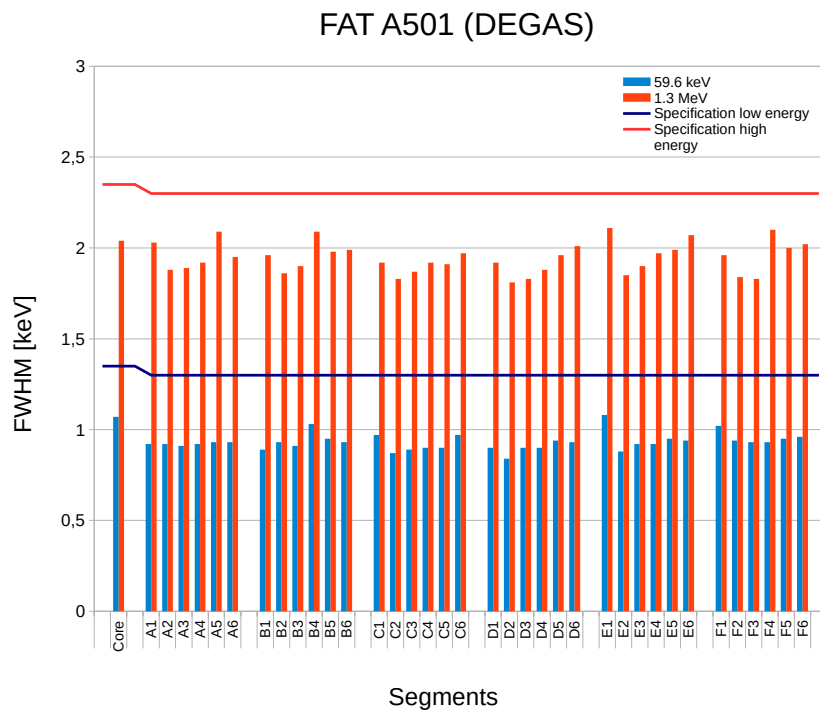
FWHM **A501**:

@ ^{241}Am : Core 1.07 keV

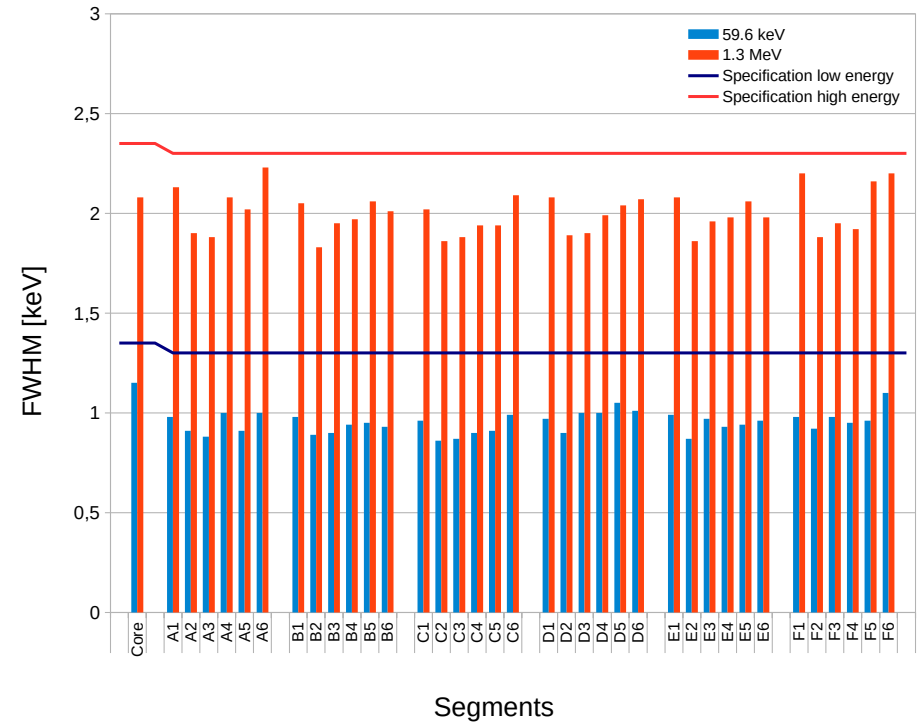
Segments average 0.931 keV

@ ^{60}Co : Core 2.04 keV

Segment average 1.945 keV



FAT C013



FWHM **C013**:

@ ^{241}Am : Core 1.15 keV

Segment average 0.951 keV

@ ^{60}Co : Core 2.08 keV

Segment average 2.001 keV

Maintenance of AGATA Triple Cryostat ATC03

- Vacuum breakdown during the physics campaign
 - leak between dewar and back flange
 - transported to Cologne for repair
 - leak repaired by CTT
- upgraded with ceramic feedthroughs and corresponding cabling
- cryostat annealed
- electronically tested
- equipped with **A002**, **B015**, **C014**

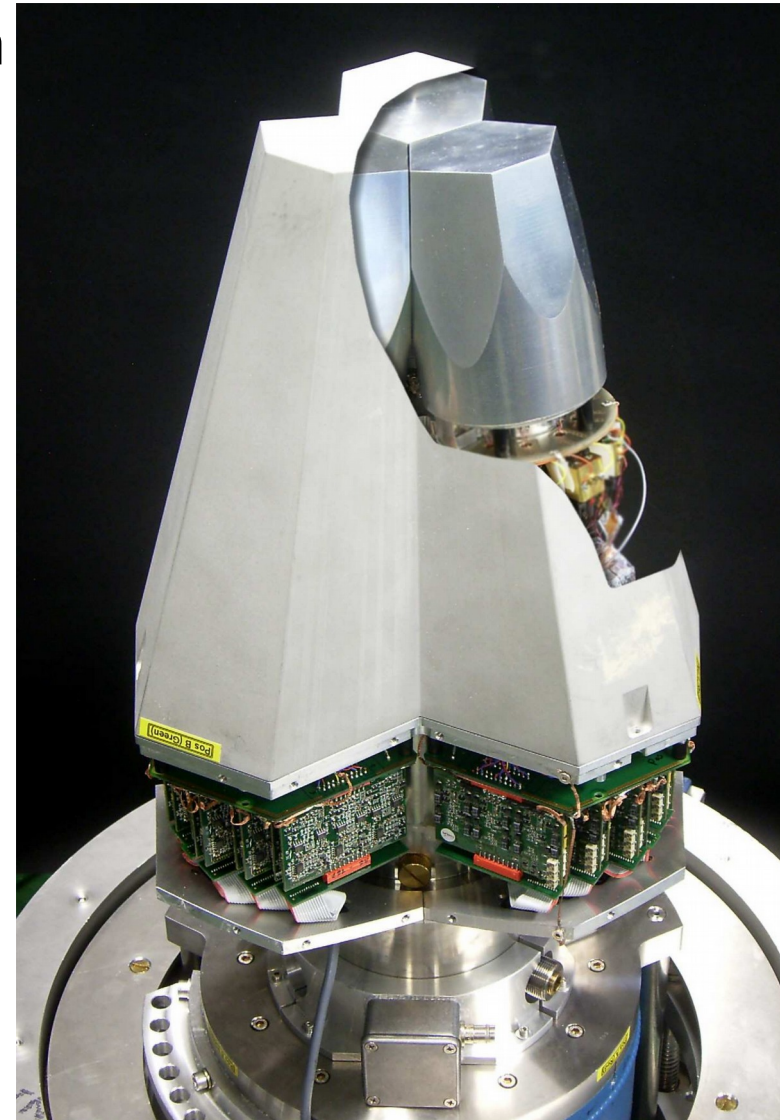
FWHM Core ($^{241}\text{Am}/^{60}\text{Co}$):

A002: 1.53/2.50 keV

B015: 1.46/2.41 keV

C014: 1.43/2.31 keV

(all this work was done in cooperation with the Strasbourg group)



Delivered to GANIL Feb. 2019

Maintenance of AGATA Triple Cryostat ATC10

- cryostat equipped with : A010, B012, C014
- HV problems, core FETs of detector B & C failed
- all core FETs replaced several times
- all cold core preamplifiers replaced → failed again (Saclay, GANIL, Strasbourg)

- transported to Cologne
- cryostat totally dismantled
- getter moved to accessible position (Front)
- dewar annealed
- all cold core preamplifiers replaced
- C014 HV problems due to vacuum leak, replaced with C003

FWHM Core ($^{241}\text{Am}/^{60}\text{Co}$):

A010: 1.30/2.28 keV

B012: 1.61/2.55 keV

C003: 1.36/2.49 keV

Delivered to GANIL February 2019



New AGATA Triple Cryostat ATC14

equipped with **A015**, **B009**, **C013**
(**A015**, **C013** new encapsulation)

Assembled by CTT in cooperation with
IPHC Strasbourg
Feedthroughs: Ceramic
Getter position: Front

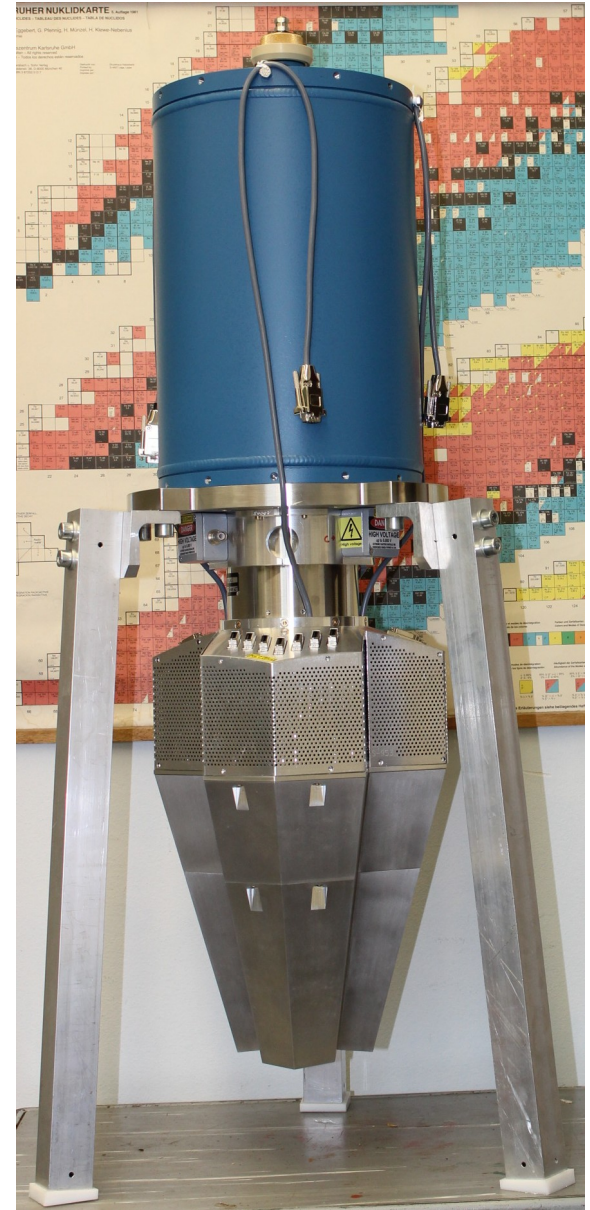
FWHM Core ($^{241}\text{Am}/^{60}\text{Co}$):

A015: 1.18/2.19 keV

B009: 1.34/2.41 keV

C013: 1.42/2.29 keV

Delivered to GANIL May 2019



Maintenance of AGATA Triple Cryostat ATC01

- equipped with **A012**, **B001**, **C004**
- HV sparking, core FETs of detector B & C failed
- all core FETs replaced several times
- oscillations on detector **B001**
- vacuum leak fixed
- all cold core preamplifiers replaced → failed again (Saclay, GANIL, Strasbourg)

- transported to Cologne
- cryostat totally dismantled
- getter moved to front position, dewar annealed
- one feedthrough replaced (CTT)

- detector **A012**, **B001**, **C004** transported to Saclay for further investigation (M. Zielinska: Report from the IRFU Saclay test laboratory)



Detectors at GANIL, end of the physics campaign 2019

41 detectors with all 1517 channels in operation at GANIL for the physics campaign

ATC02: A003, B003, C005

ATC03: A002, B015, C014

ATC04: A007, B007, C007

ATC05: A008, B002, C009

ATC06: A001, B004, C010

ATC07: A006, B013, C006

ATC08: A009, B005, C008

ATC09: A004, B008, C002

ATC10: A010, B012, C003

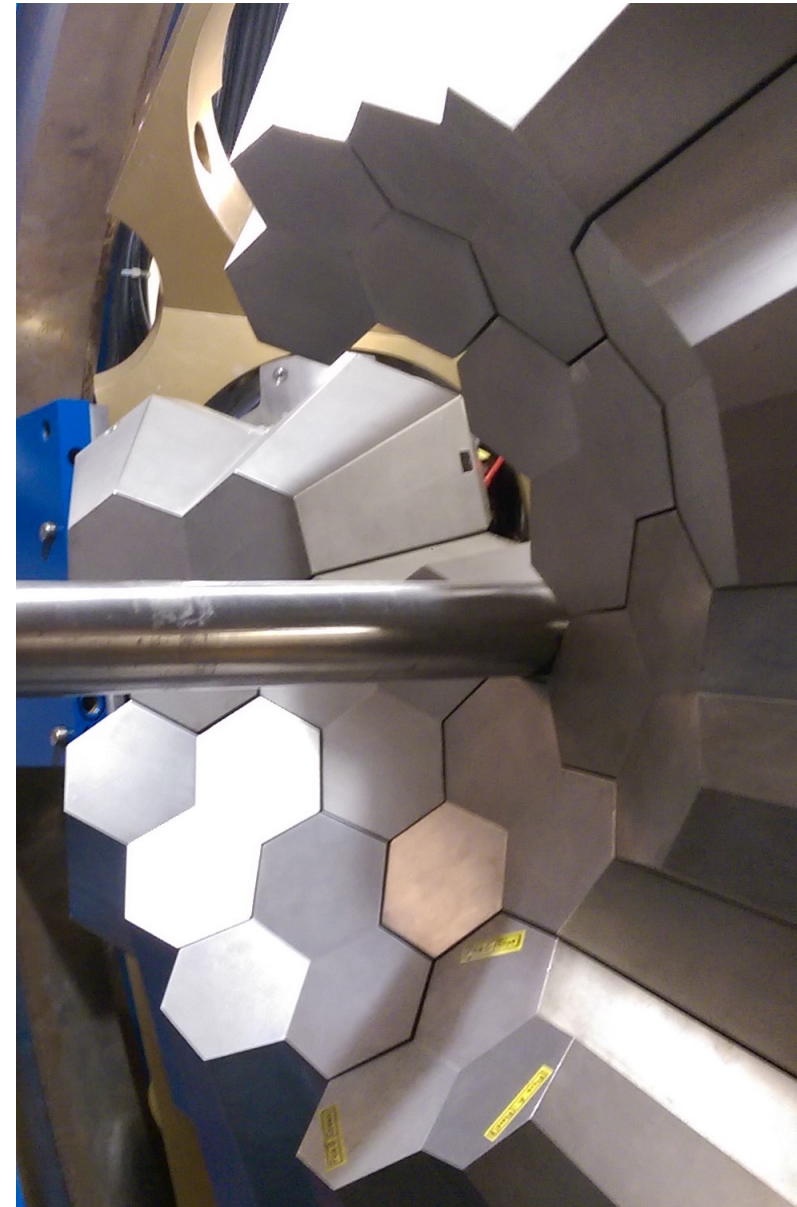
ATC11: A011, B006, C012

ATC12: A013, B014, C015

ATC13: A014, B016, C016

ATC14: A015, B009, C013

ADC03: - B011, C011



Status Capsules & Cryostats September 2019

48 detectors delivered to AGATA community

41 detectors at GANIL

5 detectors:

A012, B001, C004: CEA Saclay for tests

Magdalena Zielinska: Report from the IRFU Saclay test laboratory

A005: Liverpool, scanning

Dan Judson: Recent activity and status update at Univ. Liverpool

A016: IPHC Strasbourg, scanning

Marie-Hélène Sigward: IPHC detector laboratory and scanning table upgrade

2 detectors under repair



Status Capsules & Cryostats September 2019

Broken detectors:

at MIRION, under repair:

B010: leakage current (delivery scheduled for Nov.)

C001: leakage current after annealing (delivery scheduled for Oct.)

C501: leakage current (DEGAS) (ready for delivery)

ATC01 will be assembled at IPHC Strasbourg

DEGAS TC waiting for installation of C501

ATC02 & ATC07 issue with filling, reason under investigation

Summary

48 detectors available for AGATA (16 A-type, 16 B-type, 16 C-type)

2 detectors broken and under repair, delivery soon (1 B-type, 1 C-type)

10 detectors manufactured or repaired with the new reusable encapsulation

5 detectors distributed to the detector labs (3 A-type, 1 B-type, 1 C-type)

1 ATC under construction (+ 1 DEGAS TC)

14 x ATC + 1 x ADC + (1x DEGAS TC) available Feb. 2020



THANK YOU !!!



Emmanuel Clement
Laurent Menager
Charly Nicolle



UNIVERSITY OF
LIVERPOOL



Andy Boston
Helen Boston
Dan Judson
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Chris Everett

Magdalena Zielinska
Marc Karolak
Mariam Kebbiri



Gilbert Duchêne
François Didierjean
Michel Filliger
Marie-Hélène Sigward

Peter Reiter
Jürgen Eberth
Robert Hetzenegger
Rouven Hirsch
Lars Lewandowski

