AGATA detector tests

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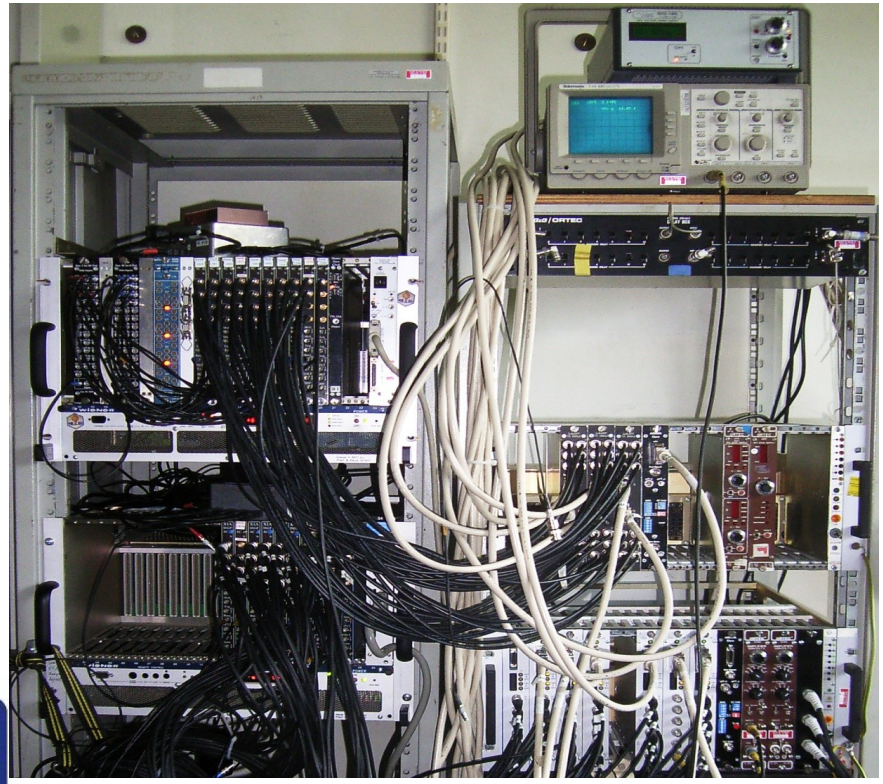
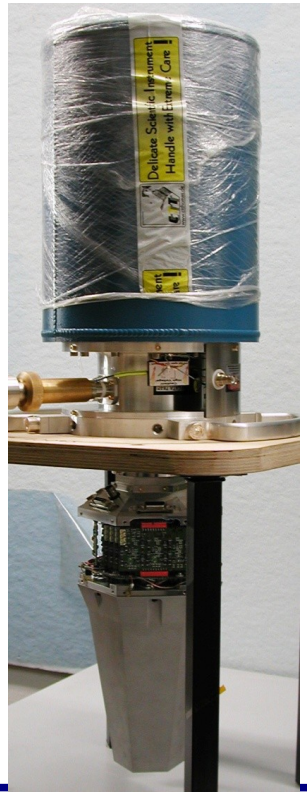
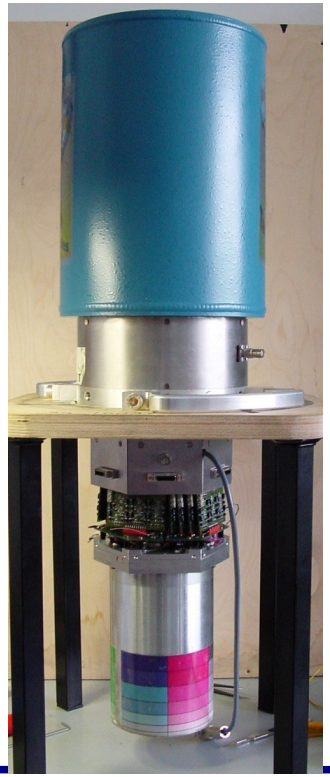
Experimental setup and specifications

Core FWHM
at 1.3 MeV: < 2.35 keV
at 122 keV: < 1.35 keV
Crosstalk < 0.1 %

Segments FWHM
at 1.3 MeV : < 2.30 keV, mean < 2.10 keV
at 60 keV: < 1.30 keV, mean < 1.20 keV

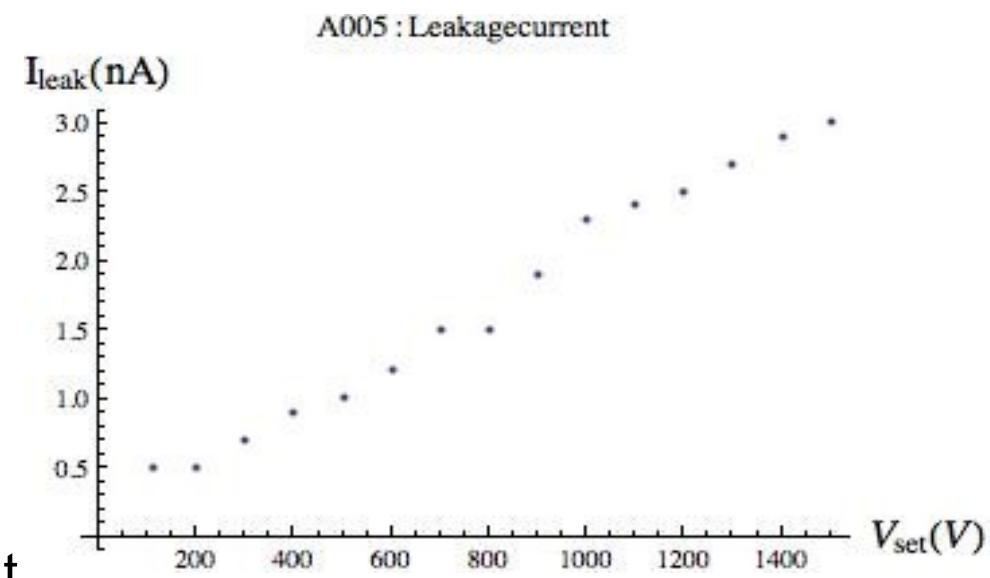






Test results A005 – 73949

Core: noise band did not decrease below 100mV (1500V)
leakage current increased linearly with applied HV
FWHM at 1.3 MeV: 13.07 keV at 6µs shaping time
11.23 keV at 3µs



Segments: noise band ~ 15mV
exception B6 ~ 80mV
FWHM at 1.3 MeV: B6 = 13.39keV
B3 = 2.27keV
B5 = 2.24keV
A6 = 2.03keV
-> Detector is suffering from leakage current
Confirmation of the Saclay results

-> Rejected

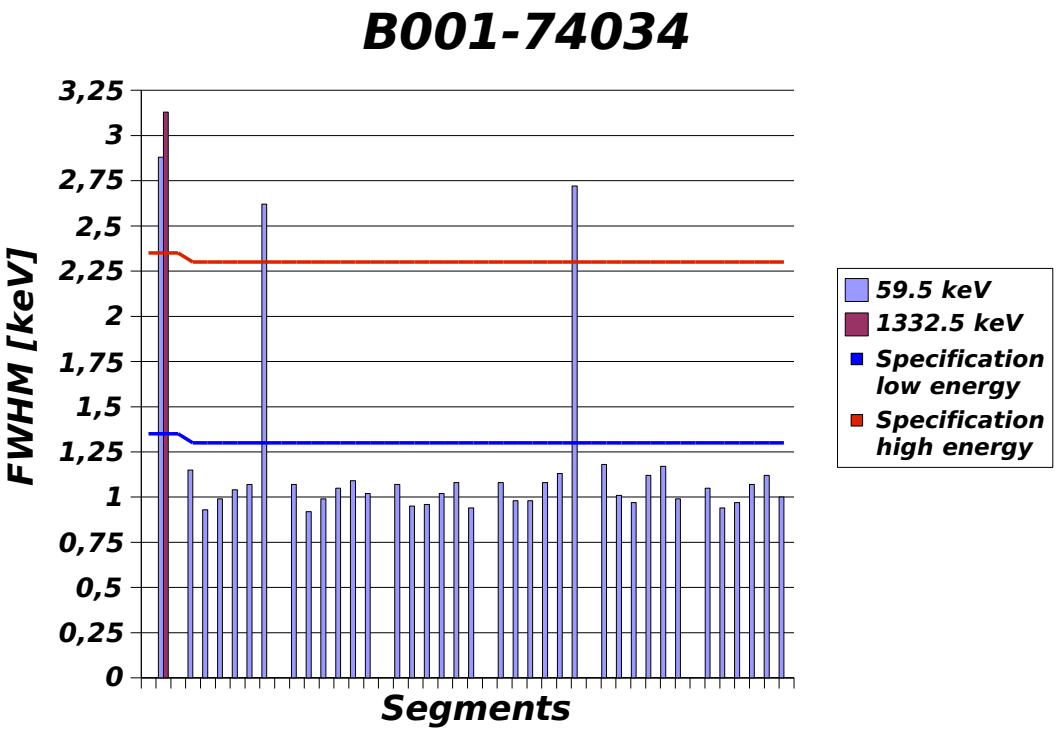
Test results B001 - 74034

Core FWHM at 1.3MeV : 3.26keV (6µs)
2.70keV (3µs)

Segments FWHM at 1.3MeV:

A6 = 2.62keV (6µs)
A6 = 1.49keV (3µs)

D6 = 2.72keV (6µs)
D6 = 1.86keV (3µs)



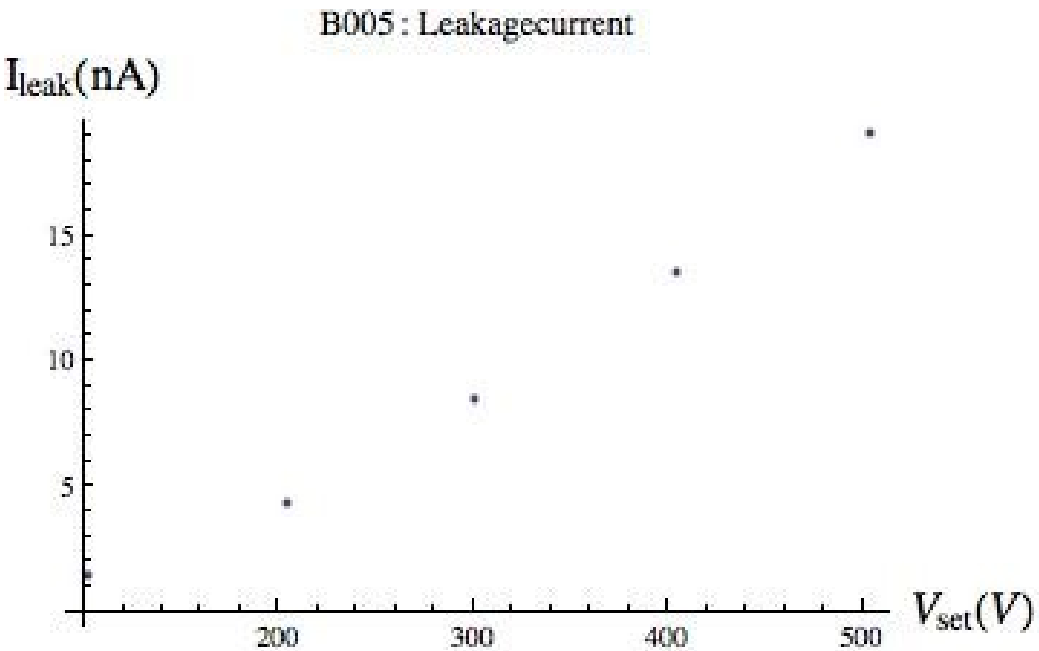
-> Detector suffers from leakage current over segments A6 and D6

-> Rejected

Test results B005 – 74065 (I)

Core

noise band increases from 150mV at 100V to 500mV at 500V
at 3µs shaping time noise band 300mV
very high leakage current, 20nA at 500V



Segments

noise band 15mV at 500V
exception F6 ~ 200mV (200V)

-> detector not operational – confirmation of the Saclay results

-> Rejected

Test results B005 - 74065

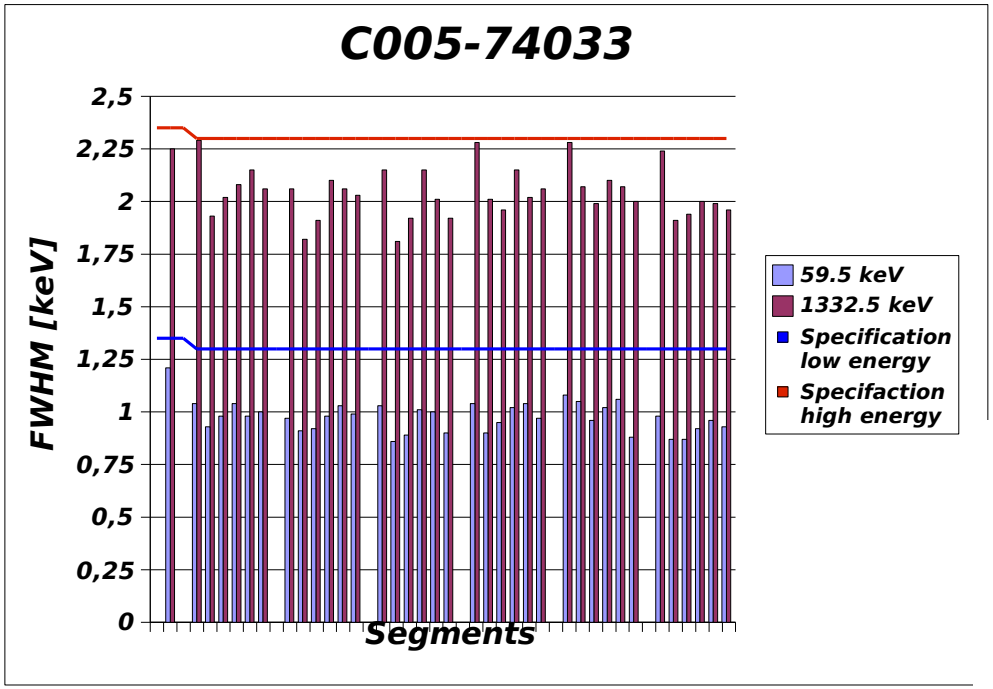
Second delivery 05.03.09
in warm condition segment B6 missing

B005 in ATC3
in cold condition all segments present

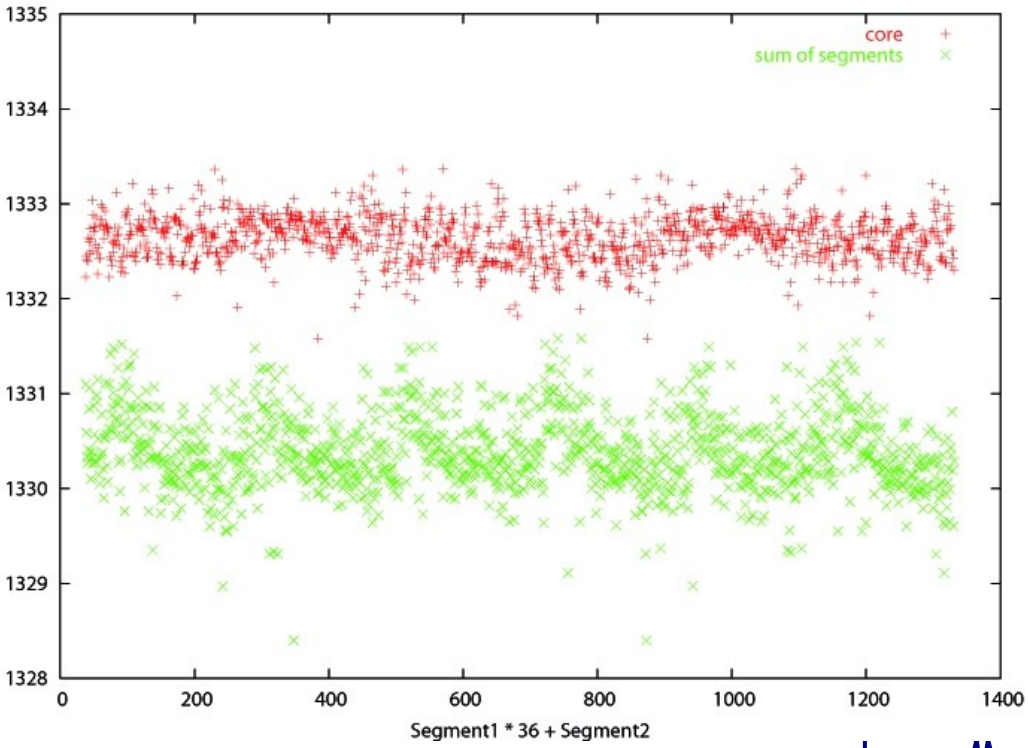
Core FWHM at 60keV 1.88keV (6µs)
1.89keV (3µs)
Segments FWHM F1 at 60keV > 4keV
-> out of specification
upside down position
FWHM at 60keV: core 1.30keV
F1 1.15keV
-> within specification

-> Test ongoing

Test results C005 - 74033



Cross talk level is within specification of 0.1%



FWHM core at 122keV = 1.21keV
at 1.3MeV = 2.25keV

-> Mounted in ATC2

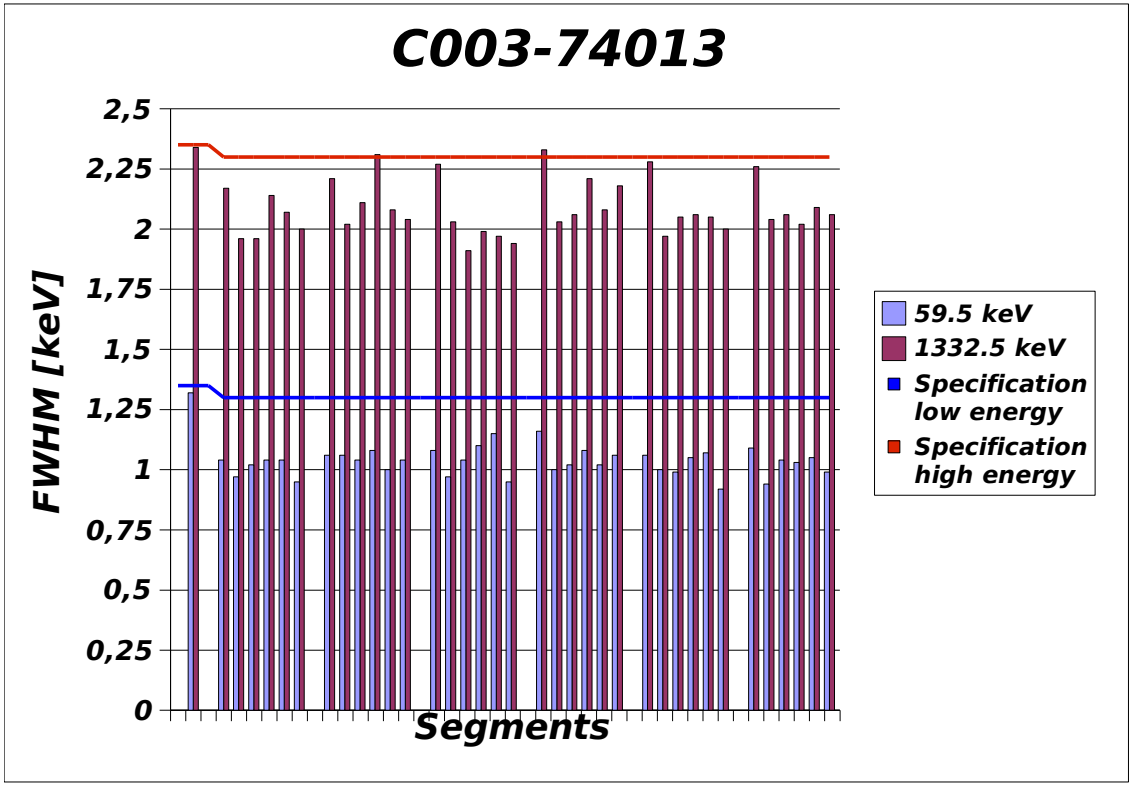
Status C003 - 74013

Accepted in summer 2007

mounted in ATC2(summer 2008)
->leakage current over segment C1

after refurbishing by Canberra
retested in winter 2008

FWHM core at 60keV = 1.32keV
1.3MeV = 2.32keV
mounted in ATC3
-> leakage current over segment C1
FWHM segment C1 = 1.63keV (1.08keV in Testcryostat)



-> New detector test required

Status B006 - 74076

CAT done in Saclay – detector within specification

delivery to Cologne

mounted in ATC3 -> leakage current over segment F5 and A1

results to be confirmed in test cryostat

-> New detector test required

Summary

5 detectors delivered since last AGATA week

2 detectors accepted (1 Cologne and 1 Saclay)

2 of the accepted detectors seem to have problems with leakage current

main problem is leakage current caused by a damage of the outer contact or the implantation layer