



Lab Status and Customer Acceptance Tests at Liverpool

C004 and B009

April – Sept 2016

Current status at Liverpool

- No people funded to work on AGATA
- 1 person trained to assemble detectors (Dan Judson)
- Used C004 and B009 to train 2nd person (Carl Unsworth)
- Student help with CAT testing

Cryostats

- Two test cryostats in regular use in Liverpool
- Cologne - in use since 2009
- Daresbury - in use since 2010



Cryostats problems - Daresbury

- Core very noisy pulser-like signal – warmed and remade all grounding connection on cold side
- Then, Intermittently no core signal
- Now core not functioning, no traces – just noise
- Replaced core FET – no improvement
- Warm / cold feed throughs very temperamental
- 1 channel of one warm preamp is dead -1v offset.

Cryostats problems - Cologne

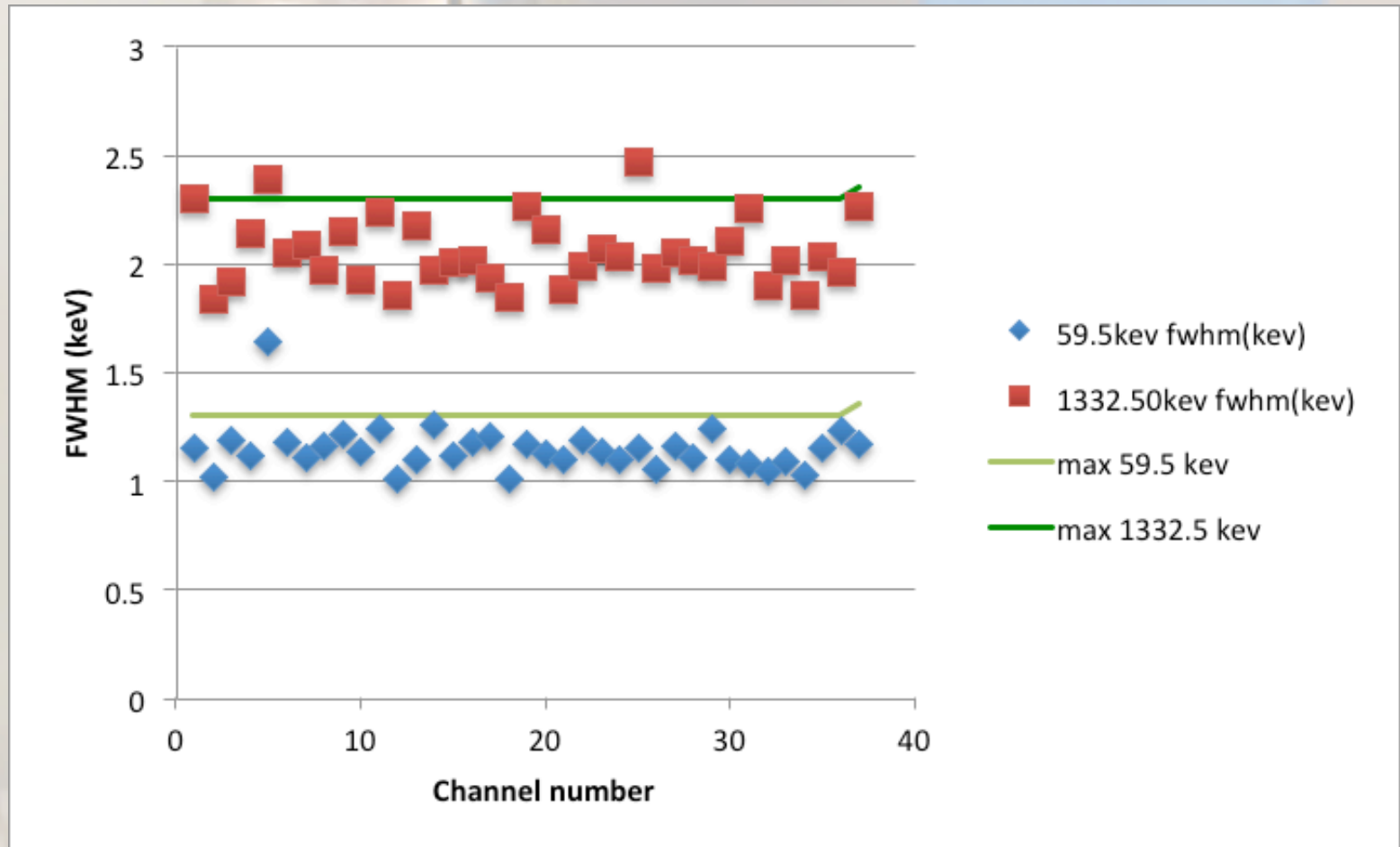
- Initially could not pump below 3×10^{-5} overnight. Now after ~ 2 weeks of pumping, 4×10^{-6} is possible overnight – a lot of outgassing – could do with being baked
- Segment A5 has had poor low energy resolution on C004, B009, C013 and A007 – all around 1.5 keV FWHM @ 60 keV.
- Changed warm preamps, FET blocks cables – problem persists
- Temperamental warm / cold feed throughs – just touching the warm-side connector on the feed through can cause a segment signal to appear / disappear
- Very hard to diagnose faults!

C004 and B009

- Initially B009 mounted in Daresbury cryostat – no segment D4 signal -1V offset
- Tried swapping all cold FET cables etc – No change
- Removed C004 and put B009 into Daresbury cryostat – D4 was ok but no E1 or core
- Put B009 in Cologne cryostat eventually got all segment + core signals working + CAT test done
- Put new PCB on C004 and rebuilt into Cologne cryostat – all signals ok + CAT test done

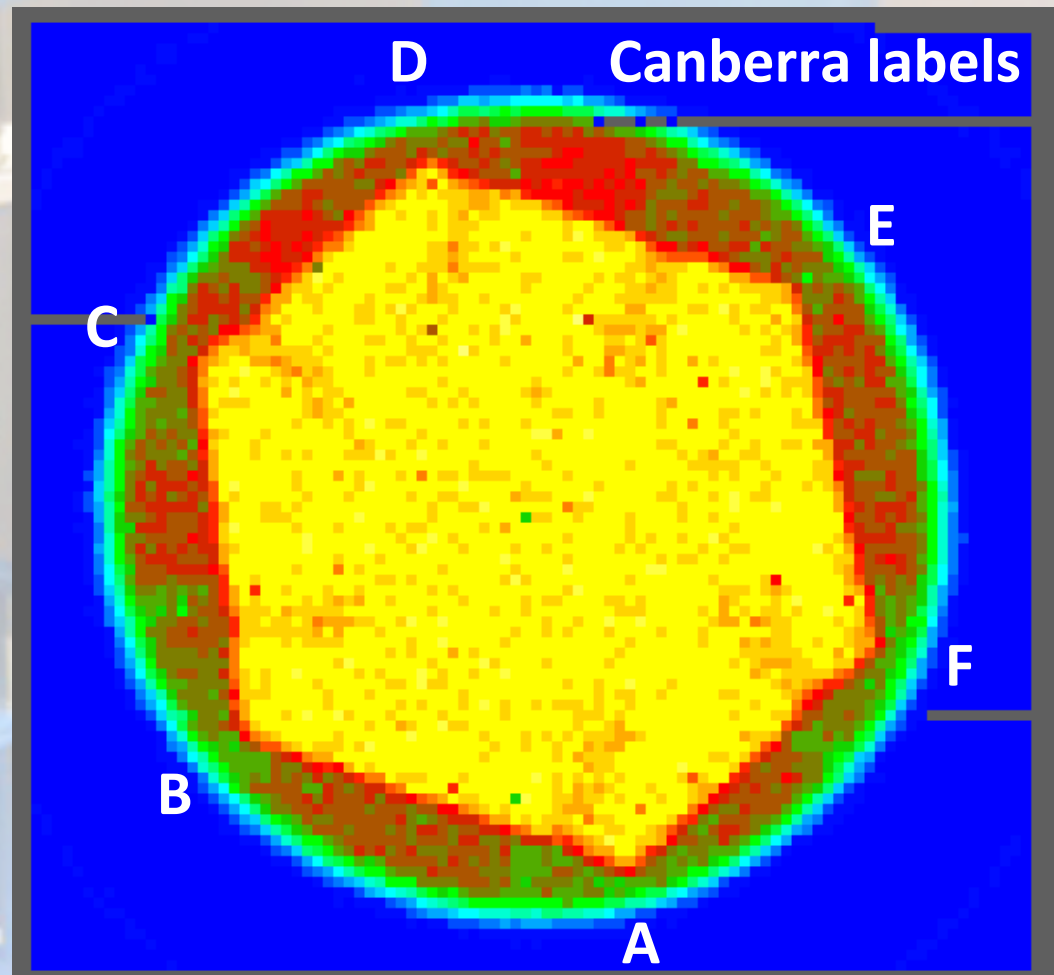
CAT results B009

- All resolutions ok except A5 @ 60 + 1332 keV and E1 @ 1332 (+ ~0.1 keV noise)



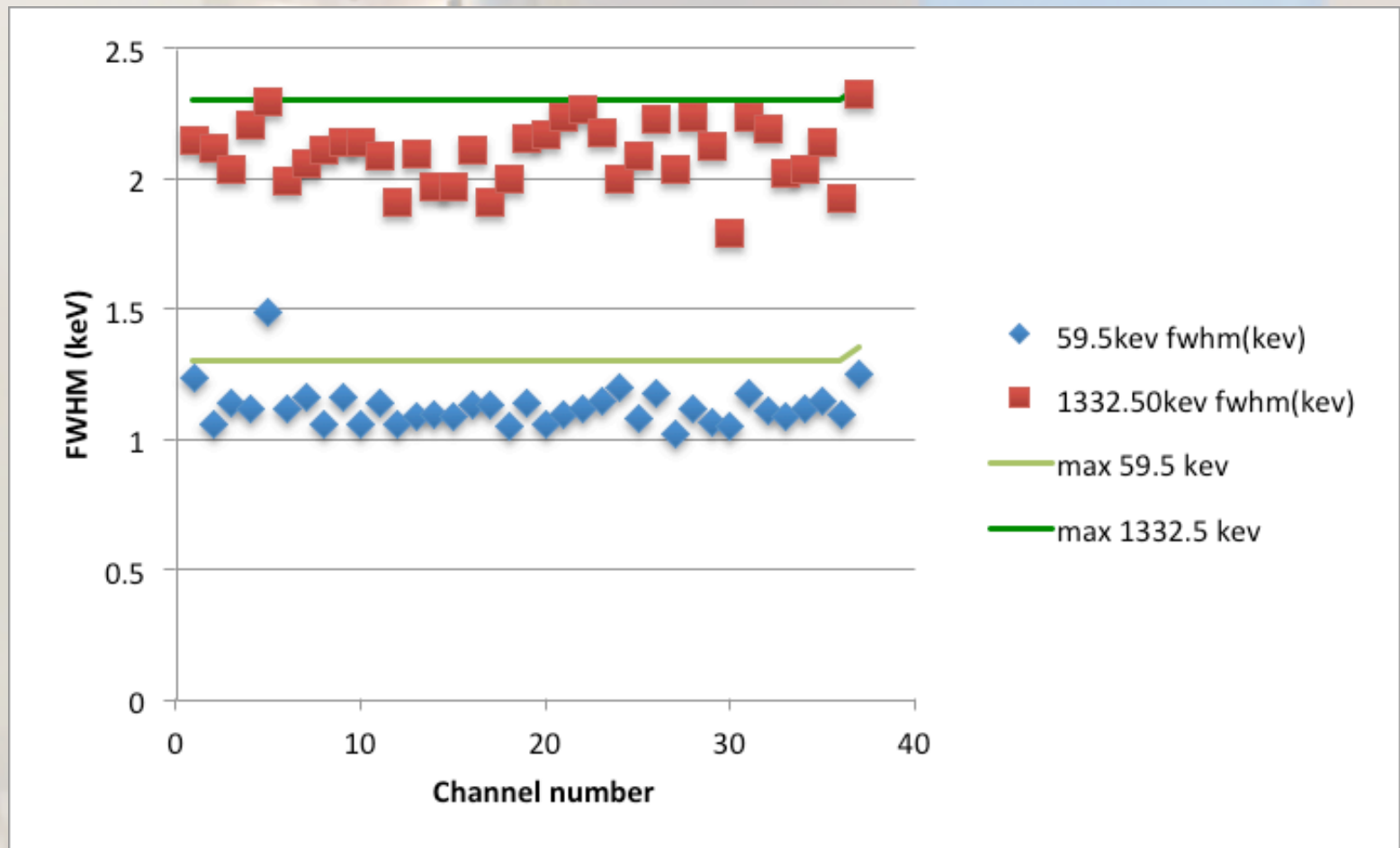
B009 - ^{241}Am surface scan

- B009 was previously damaged at segment F1
- Canberra shaved ~ 20g of material off to repair crack
- Not evident on scan results



CAT results C004

- All resolutions ok except A5 @ 60 keV



Key message

- The two cryostats are going to require some TLC soon
- Liverpool detector lab remains able to perform CAT on a “best effort” basis
- Upgrades to vacuum systems and detector characterisation facility have been bid for in the most recent Nuclear Physics grant request
- Refurbishment of OLL may impact operations in Q3-4 2017



Lab Status and Customer Acceptance Tests at Liverpool

C004 and B009

April – Sept 2016