



The AGATA triple cluster detector

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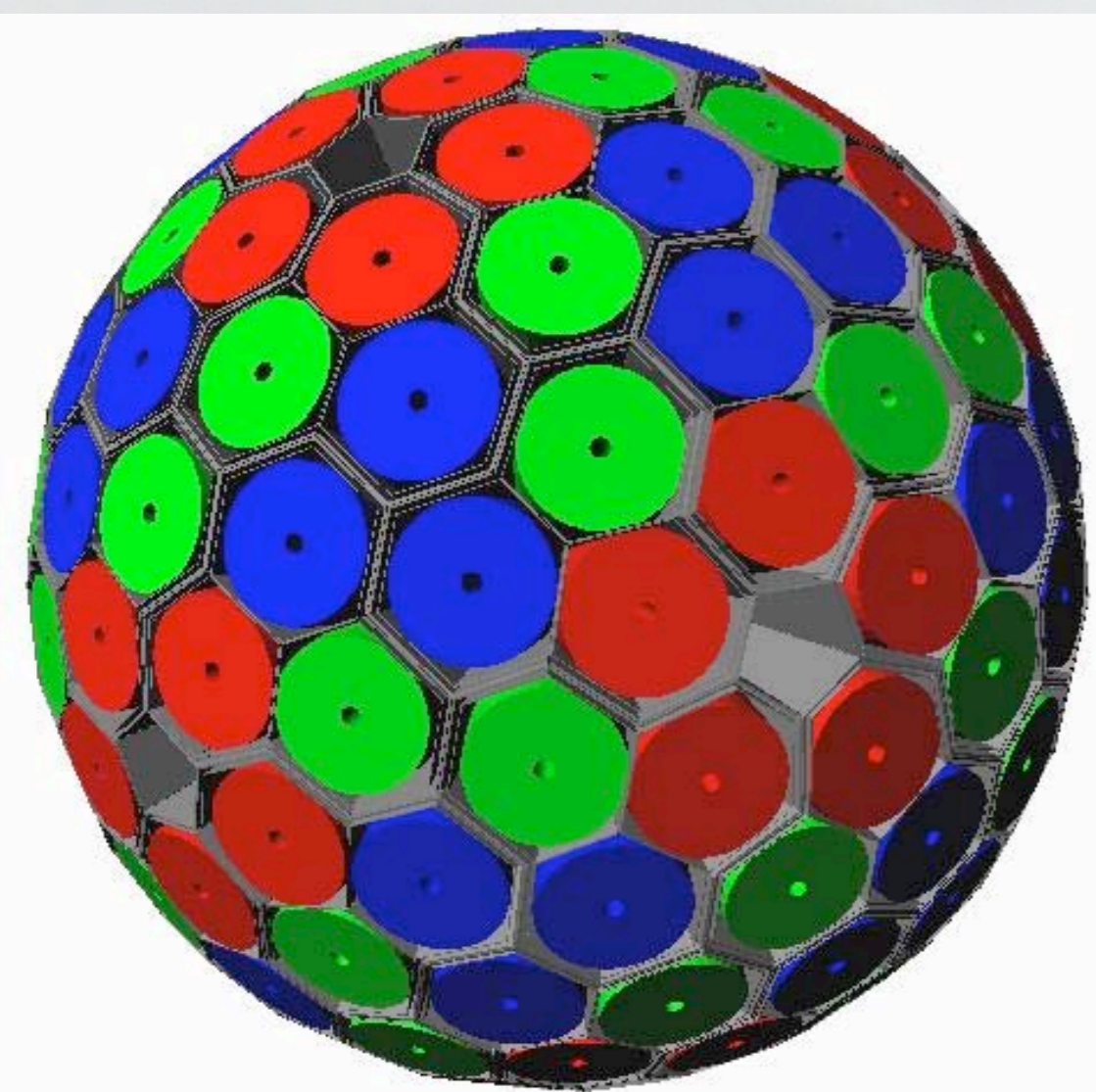


Universität zu Köln

High resolution γ -spectroscopy employing exotic beams with AGATA (Advanced Gamma Tracking Array)



- 180 irregular shaped, 36 fold segmented HPGe-crystals
- 3 different crystal shapes
- hermetically sealed in aluminium can



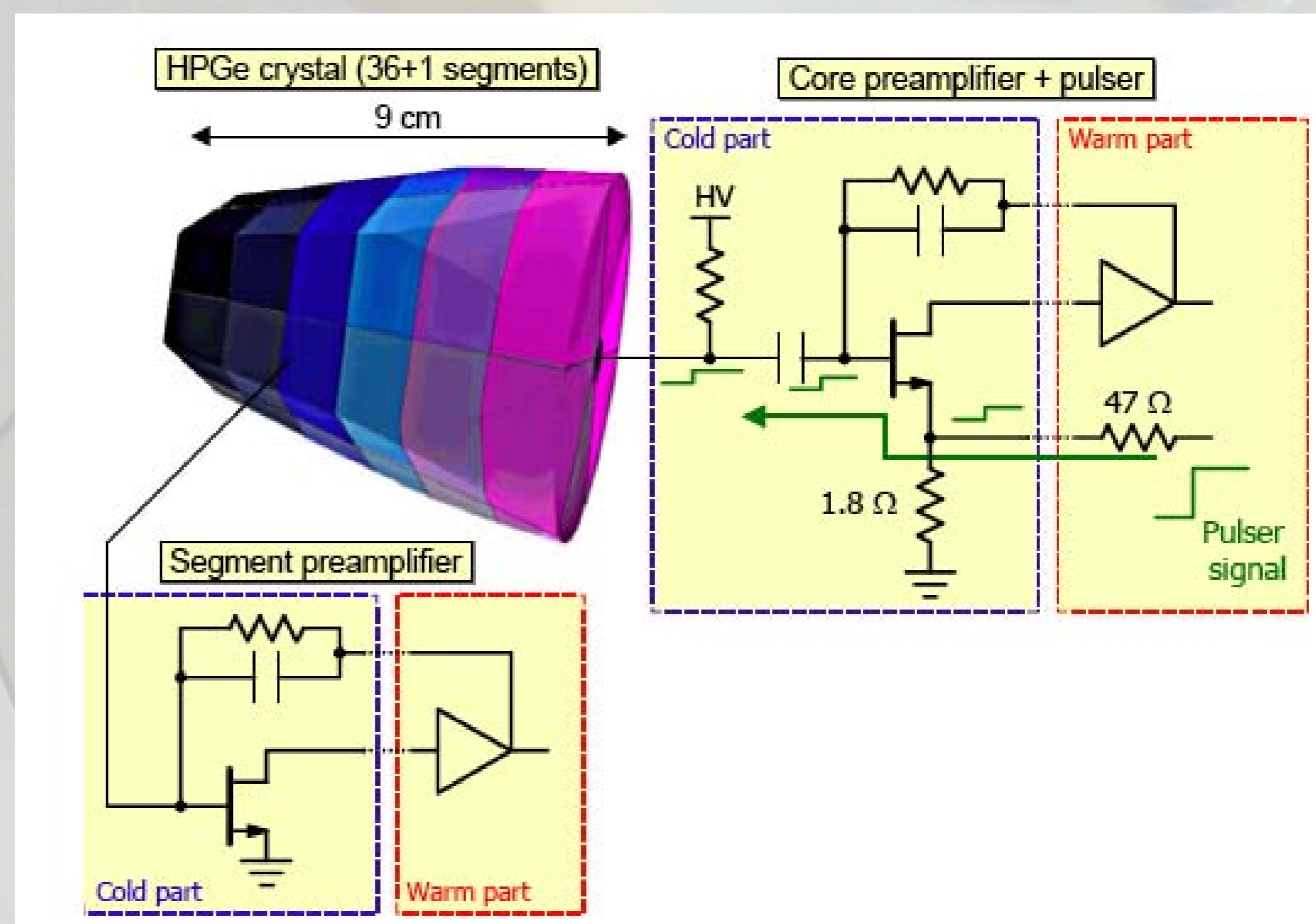
	AGATA	today's arrays
Efficiency: ($M_\gamma = 1$)	43 %	10 %
Efficiency: ($M_\gamma = 30$)	28 %	5 %
$\frac{\text{Peak}}{\text{Total}}$: ($M_\gamma = 1$)	58 %	55 %
$\frac{\text{Peak}}{\text{Total}}$: ($M_\gamma = 30$)	49 %	40 %
Angular Resolution	~ 1	
FWHM (1 MeV, $\frac{v}{c} = 50\%$)	6 keV	40 keV
Rates ($M_\gamma = 1$)	3 MHz	1 MHz
Rates ($M_\gamma = 30$)	300 kHz	20 kHz

E_γ	FWHM Core [keV]	FWHM Segments [keV]
60 keV	≤ 1.35	≤ 1.30
1.3 MeV	≤ 2.35	≤ 2.30



AGATA-cryostat:

- Crystals operated at LN2 temperature and high vacuum
- Connection between warm and cold preamplifier
- Reliable signal transmission

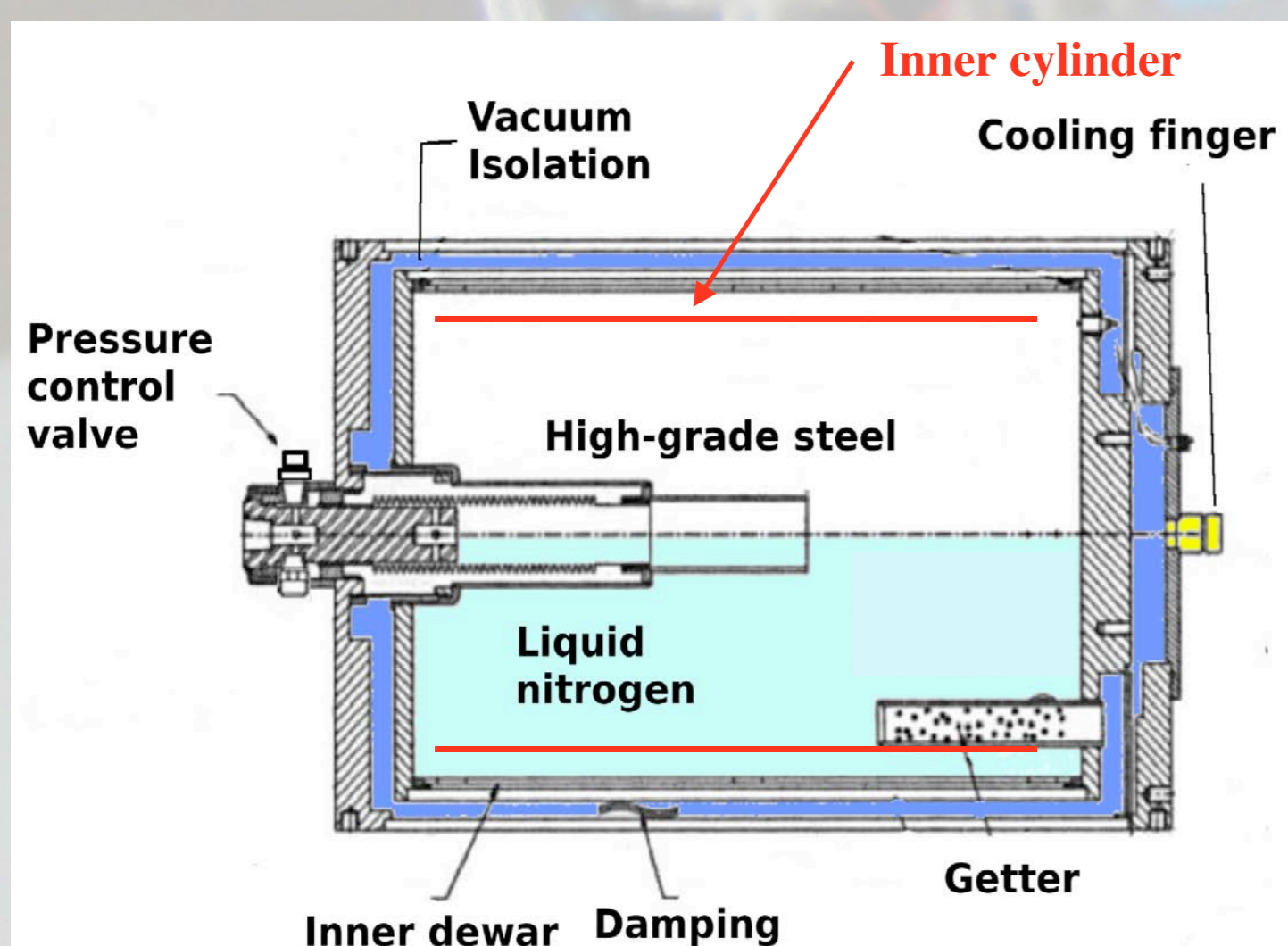


Electronics:

- 111 FETs serve first amplification stage
- High precision pulser on core preamp

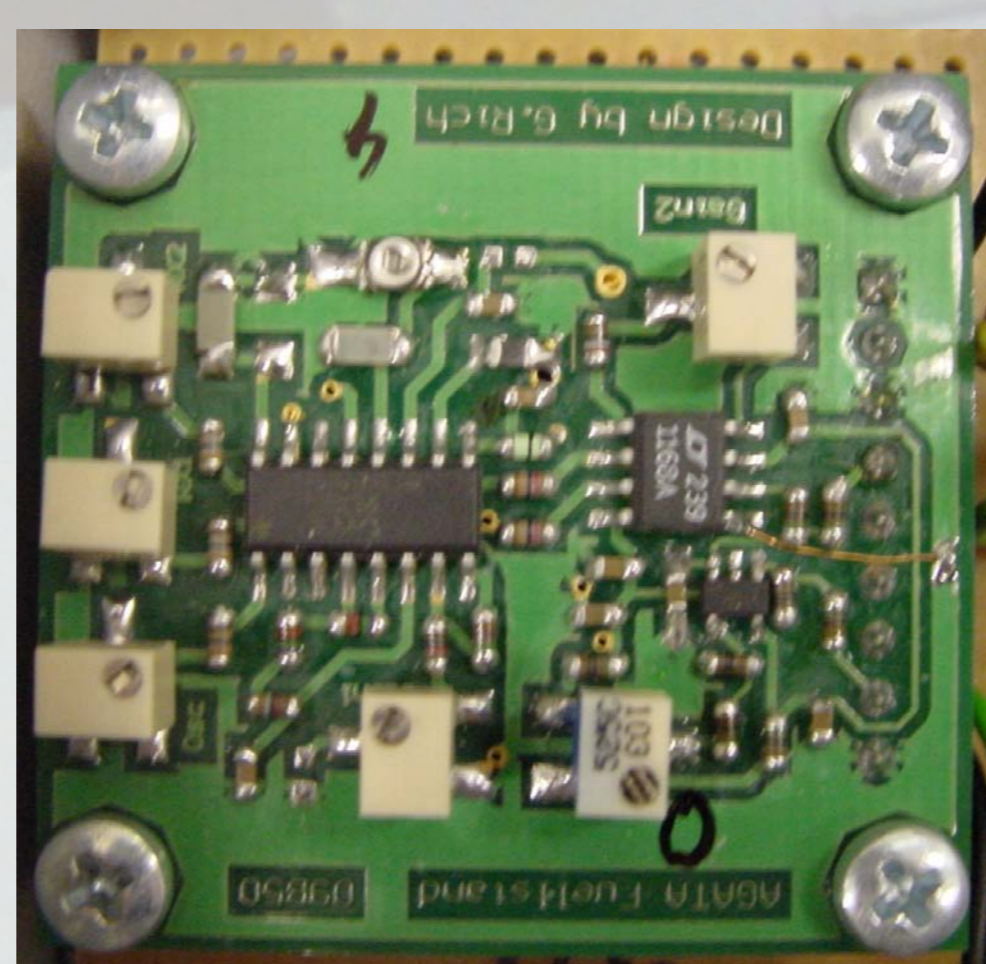


A novel LN2 fill level meter

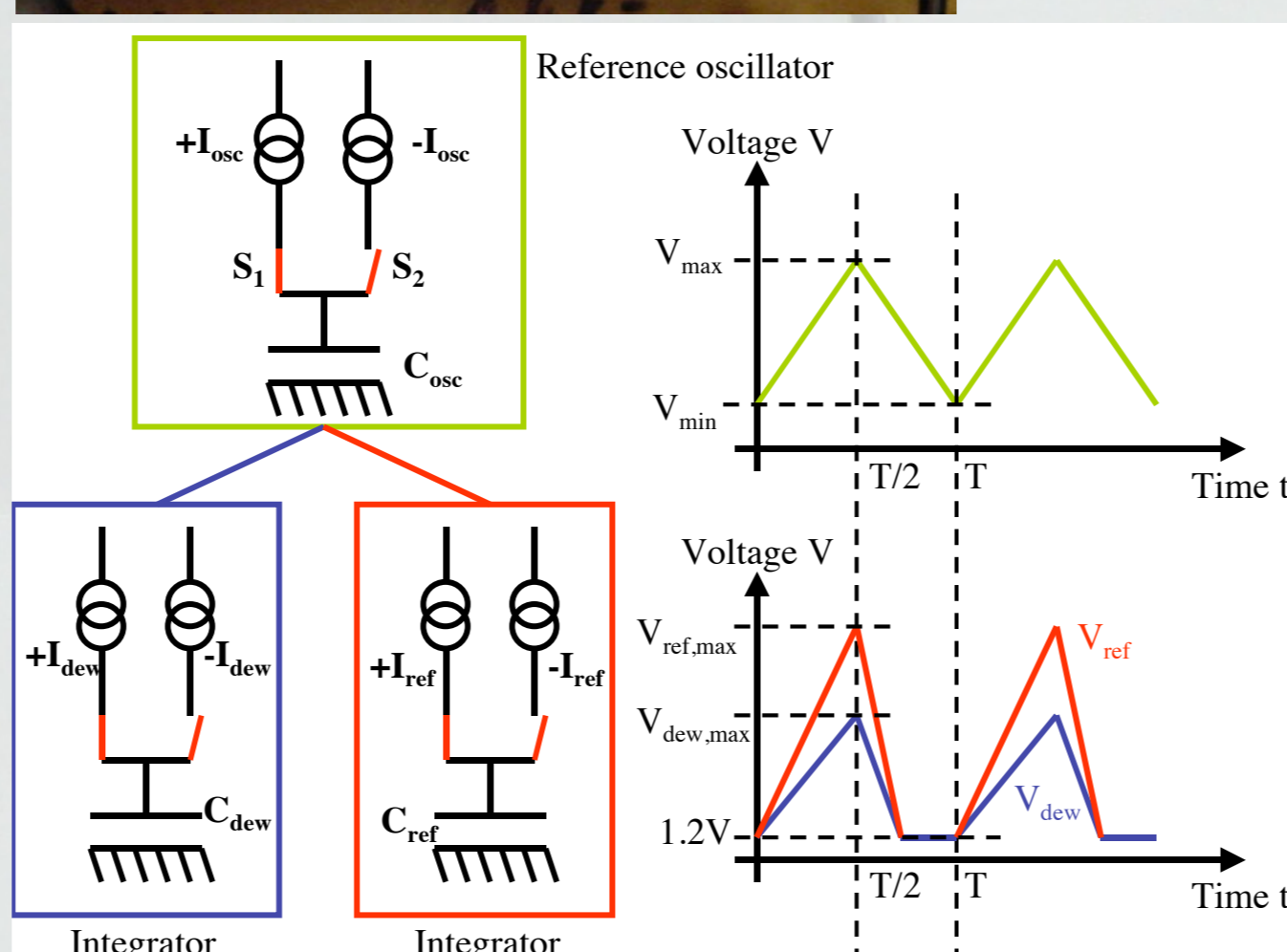


- AGATA dewar as cylindrical capacitor
- Capacity as function of LN2 level
- Direct read out of LN2 level
- Information about LN2 consumption
- $\Delta C = 130 \text{ pF} \sim 12\%$

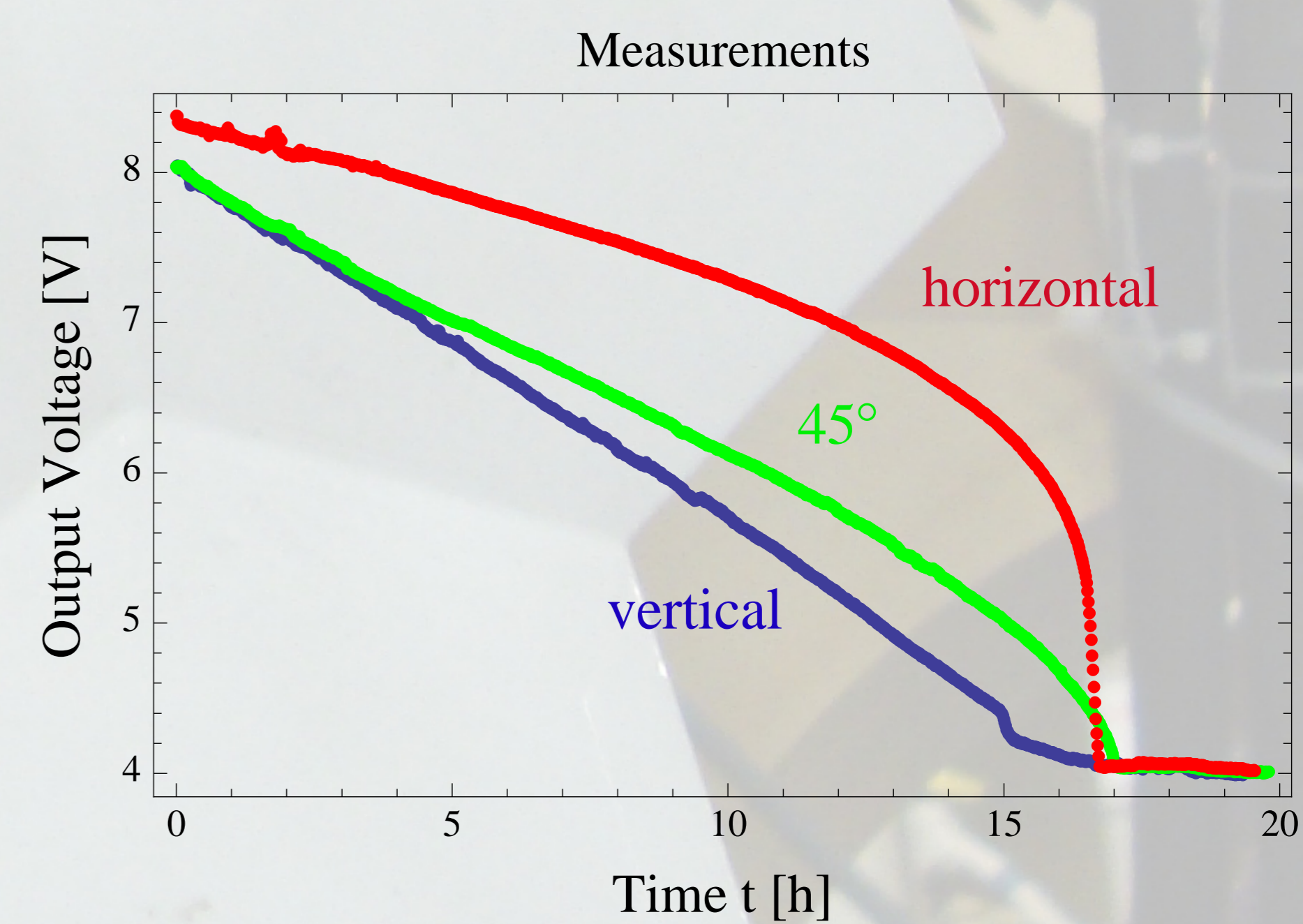
The C/V - transducer



- Sensitive to ΔC by using reference capacity
- DC voltage signal: $\Delta V = 50\%$

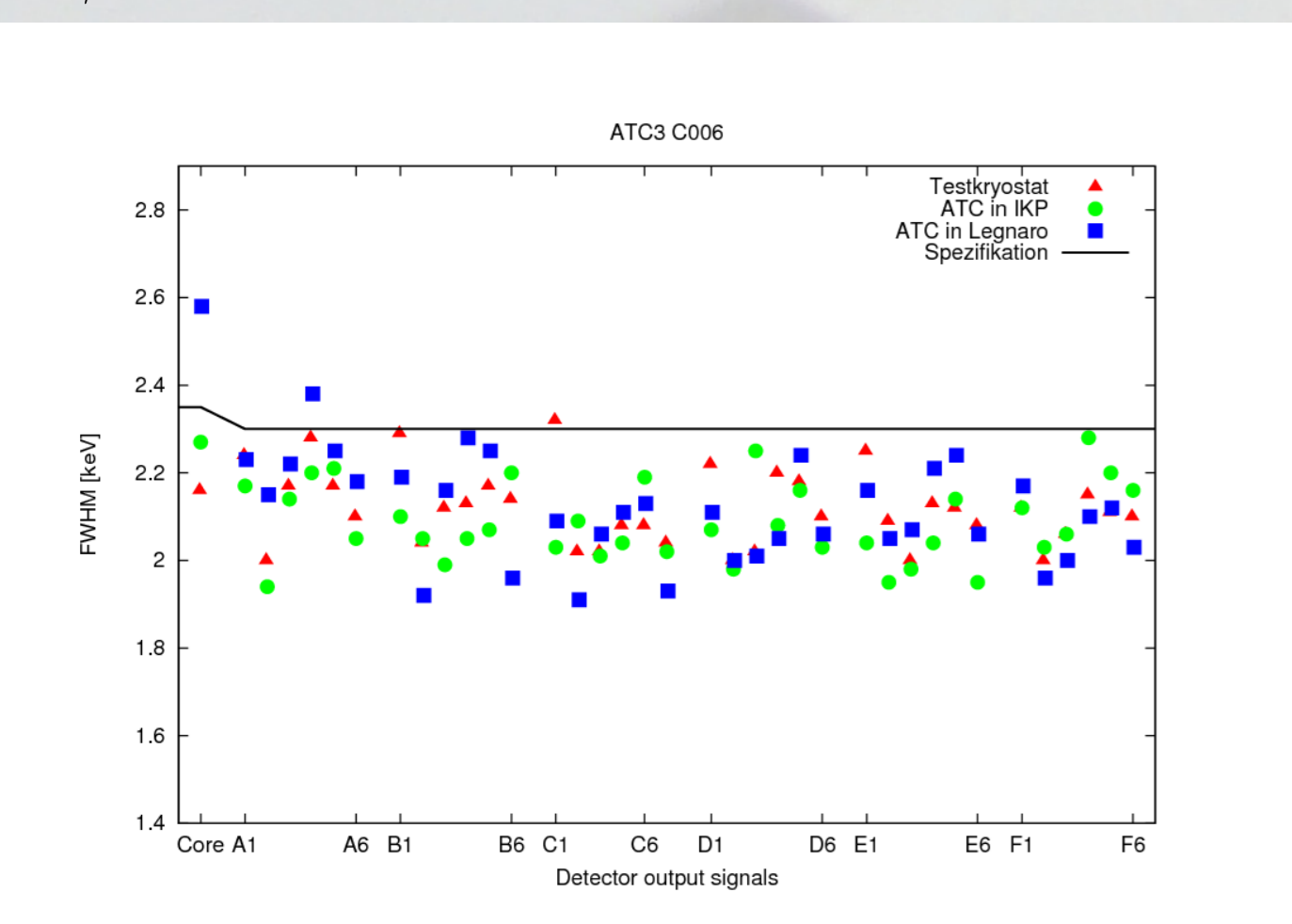


LN2 level for different inclination



AGATA @ Legnaro (Italy)

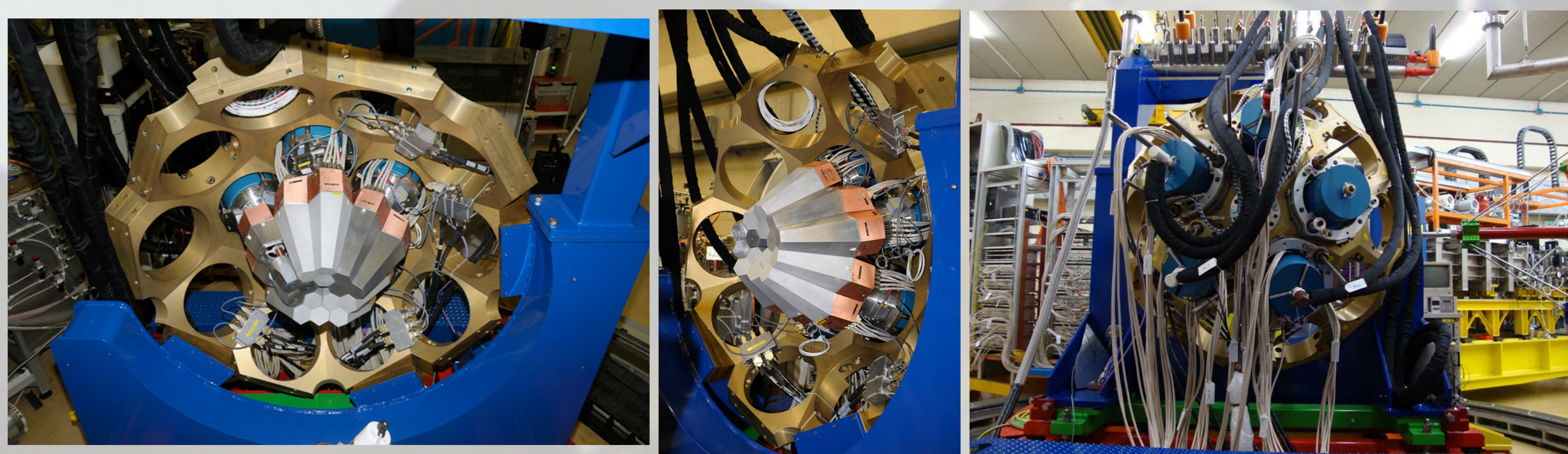
$E_\gamma = 1.3 \text{ MeV}$ (Segments + Core)



Mean values of FWHM (Segments):

- $E_\gamma = 60 \text{ keV}$ FWHM = 965 eV
- $E_\gamma = 1.3 \text{ MeV}$ FWHM = 1.94 keV

4 ATCs fully operational in demonstrator with PRISMA + DANTE



[1] D. Bazzaco et al., AGATA technical proposal [2] Wiens et al., NIM A 618 (2010) 223-233

[3] D.Lersch, Diploma Thesis, A novel liquid nitrogen fill level meter for the AGATA triple cluster detector (2009)