Low BKG Germanium Detector ISOTTA project

(ISOTope Trace Analysis)

Advanced Techniques for the Production, Purification and Radio-Purity Analysis of Isotopically Enriched Sources for Double Beta Decay

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ISOTTA: WP3 – The low background detector for underground laboratory (TASK 2)

1. Germanium crystal purchase from Umicore, Belgium (about 0.6 kg)
2. Crystal drilling at IFJ PAN
3. Low background cryostat – Baltic Instruments, Latvia
4. Implantations and formation in germanium detector workshop at IFJ PAN
5. Standard NIM electronics from Canberra
6. MCA Tukan 8k from NCBJ, Poland
7. Optimisation of shields using Geant
8. 2.5 t lead shield (under construction)
9. Moving into SUNLAB

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Crystal

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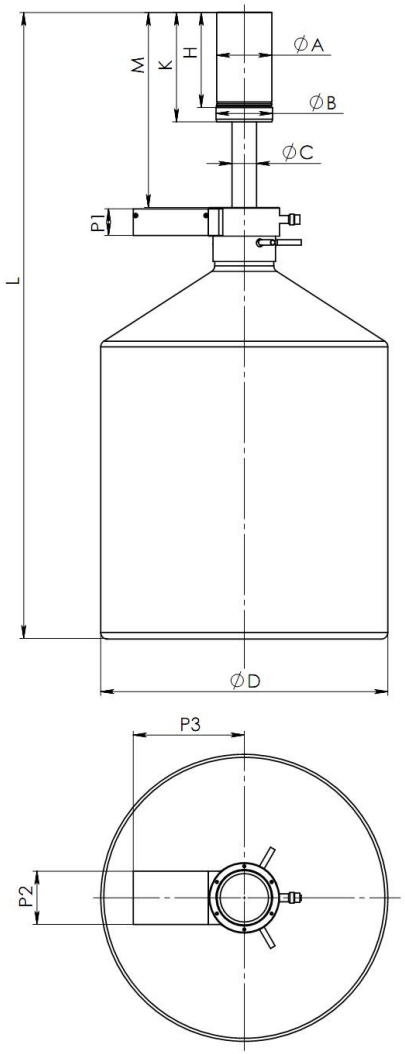

Value	mm
A	70
B	72
C	39
D	450
H	144
K	165
M	293
P1	40
P2	80
P3	170
L	942

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Materials and other mechanical parameters (Baltic Scientific Instruments)

Electrolytic copper (cold finger) Th + U < 0.1ppb

Material for detector holder and endcup 5N5 AlSi 1% Th + U < 1ppb

Material for cold finger housing and main part of preamplifier housing Stainless steel

Diameter of endcap, mm 83

Material of input window Carbon fibre

Thickness of input window, mm 0.8

TOTAL for 22 L dewar and cryostat with preamplifier – 8.5 k euro

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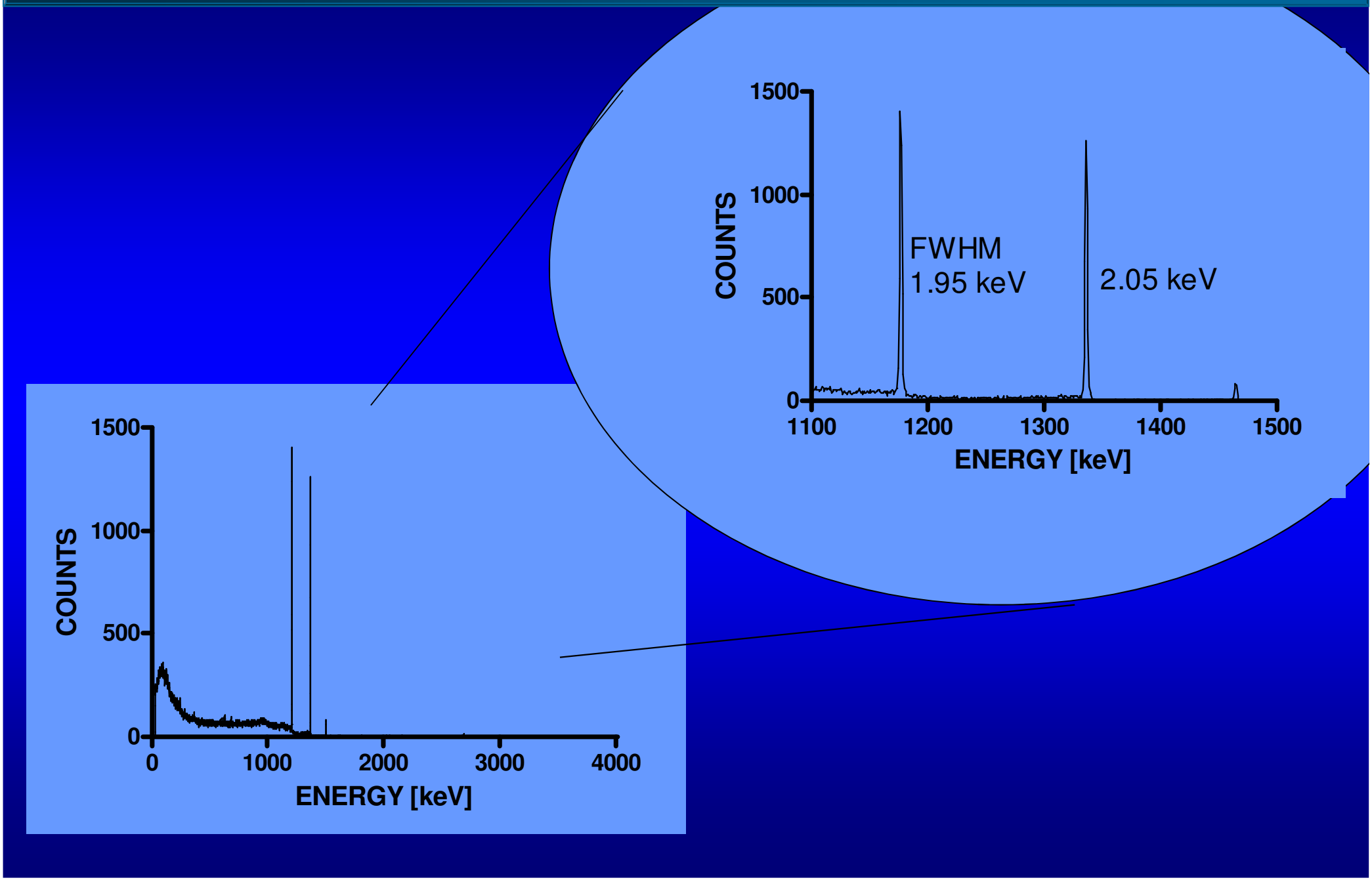
Polish TUKAN 8k MCA

Canberra NIM electonics

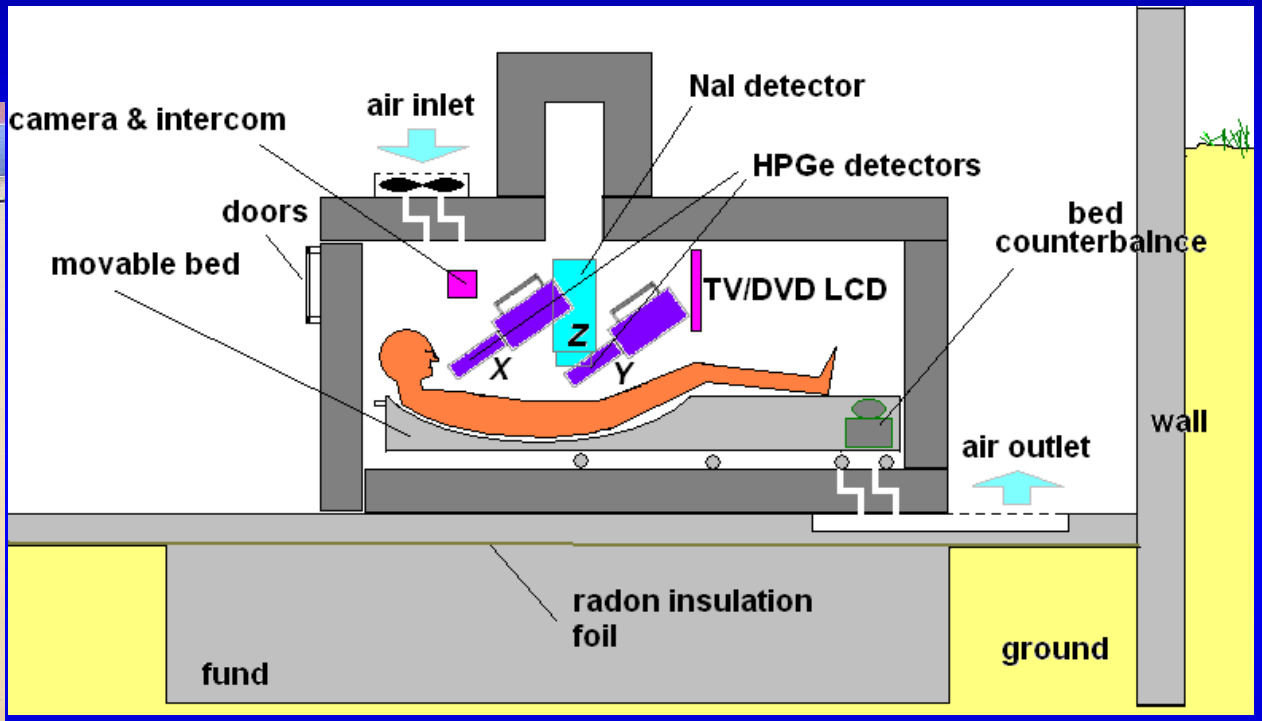
Old NIM cage (Hungerian)

Spectrum of Co-60 (unshielded)



Tests - planned

1. Inside Whole Body Spectrometer Shield



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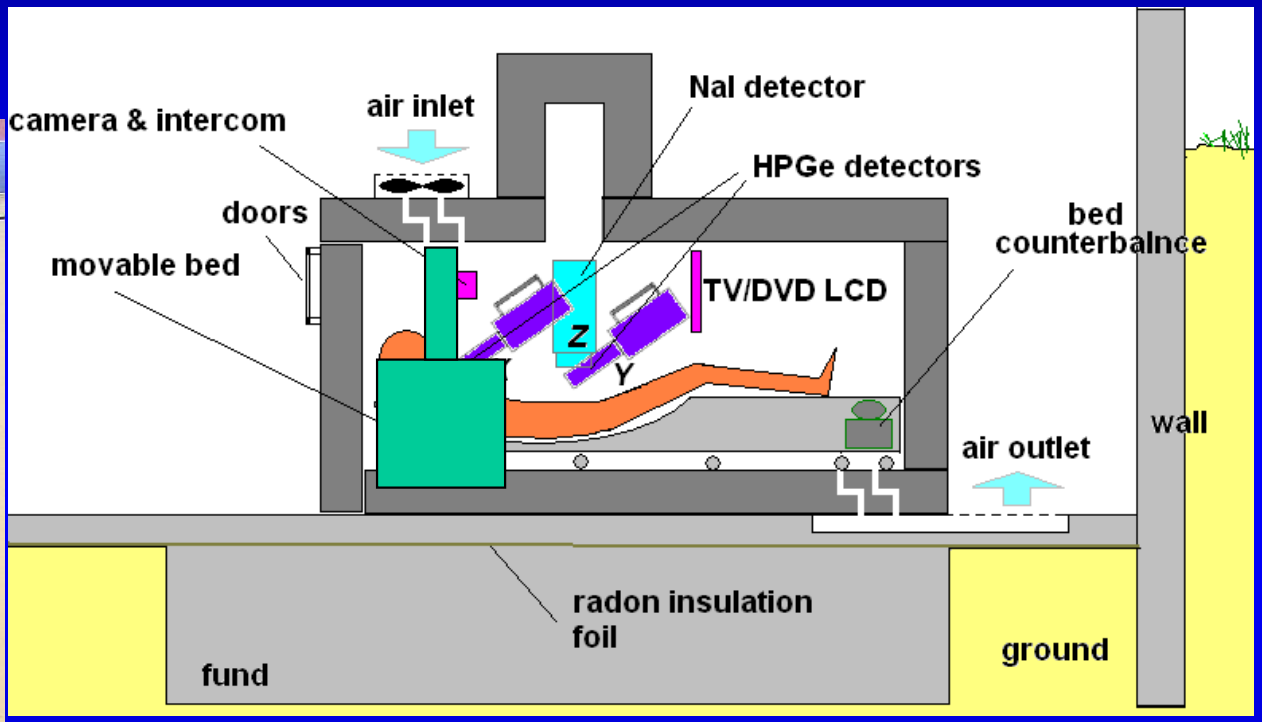

Tests - planned

1. Inside salt cave in Sieroszowice mine (?)

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