



TG11 overview

W. Hampel (MPIK Heidelberg) for Task Group 11

● Material screening and purification results for GERDA

Some Dario screening results

Argon purification

→ H. Simgen

Recent Rn emanation results

→ G. Zuzel

~~Some recent GeMPI screening results~~

~~M. Laubenstein~~

new → ICPMS measurements carried out at LNGS

→ C. Cattadori

HADES results on pogo pins and welding rods

→ M. Hult

● Low-level instrumentation for material screening in GERDA

γ -ray screening at Baksan

Status of the MPIK Corrado γ -ray detector

Renovation of the MPIK Low-Level Lab

Status of the Radon monitor

Status of GeMPI 3 and GeMPI 4

→ ~~M. Laubenstein~~ M. Heisel

First results from the HADES sandwich detector

→ E. Wieslander



List of material screening measurements obtained with the Bruno, Corrado and Dario spectrometers at MPIK

Bruno	Coarse-grained glass granulate
	IAEA grass sample
	IAEA soil sample
	NPL concrete sample
	Fine-grained glass granulate
	Gadolinium Nitrate for DoubleChooz
Corrado	Lead wire for GeMPI 3 seal
	NPL GL solution sample
	PPO for DoubleChooz
	NPL concrete sample
Dario	Stainless steel sample 5mm for LArGe
	IAEA water sample
	Roman lead FET shield
	Stainless steel sample 3mm for LArGe
	Superinsulation foil
	Lead wire for GeMPI seal
	NPL GL solution sample

Stainless steel results for the LArGe cryostat in the GERDA Detector Lab obtained with Dario

Sample	Mass	Counting Time [d]	Specific activity [mBq/kg]				
			²²⁸ Th	²²⁸ Ra	²²⁶ Ra	⁴⁰ K	⁶⁰ Co
SS 1.4571 5 mm	57.23 kg	3.54	< 0.5	< 2.4	< 0.8	< 4.0	1.6 ± 0.2
SS 1.4571 3 mm	53.41 kg	9.12	< 1.1	< 1.8	< 1.1	< 3.3	5.5 ± 0.3

For comparison: best result of the cryostat steel samples obtained with Dario →

< 0.8	< 1.4	< 0.6	< 1.7	16.7 ± 0.4
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Superinsulation foil screening results obtained with Dario

Sample	Mass	Counting Time [d]	Specific activity [mBq/kg]			
			^{228}Th	^{228}Ra	^{226}Ra	^{40}K
SI foil	0.50 kg	12.68	< 52	< 97	231 ± 27	1940 ± 150

Comparison of the screening results for the Superinsulation foil and the cryostat steel

		^{228}Th	^{226}Ra
Cryostat stainless steel	Average specific activity [mBq/kg] (1)	< 0.83	< 0.81
	Background index [cts/keV·kg·y]	< $1.7 \cdot 10^{-5}$	< $2.3 \cdot 10^{-6}$
Superinsulation foil	Average specific activity [mBq/kg] (2)	< 0.11	0.48 ± 0.06
	Background index [cts/keV·kg·y]	< $2.2 \cdot 10^{-6}$	$1.4 \cdot 10^{-6}$
	Percentage of steel value	13	> 60

- (1) Averaged over all cryostat stainless steel measurements and corrected for the Ar shielding of the top/bottom parts
- (2) Scaled with the mass ratio (SI foil / cryostat steel = 80 kg / 30 t) and corrected for Ar shielding of the top/bottom parts

HPGe detectors at Baksan Neutrino Observatory

- All four IGEX/Baksan HPGe detectors have been continuously operated at BNO for more than 14 years
- Observed last year: increased noise level (probably due to vacuum problems) for the 3 enriched IGEX detectors
- Therefore: decided to dismount the whole 4 HPGe detector setup, pump the 3 IGEX detectors (done in April 2007) → noise level returned to the former value
- Also: decided to modify and renew the electronics and the DAQ system (built in 1993). Will be finished in June 2007
- Background measurements for 1 or 2 months.
→ Resume material screening for GERDA in August or September 2007

Alexander Klimenko
Anatoly Smolnikov
Sergey Vasiliev
Konstantin Gusev
Mark Schircheno
Valery Kuzminov
Albert Gangapshev



Corrado γ -ray spectrometer at MPIK

Statement at the Ringberg Collaboration Meeting:

Corrado is expected to be ready for screening in 5-8 weeks → fulfilled !

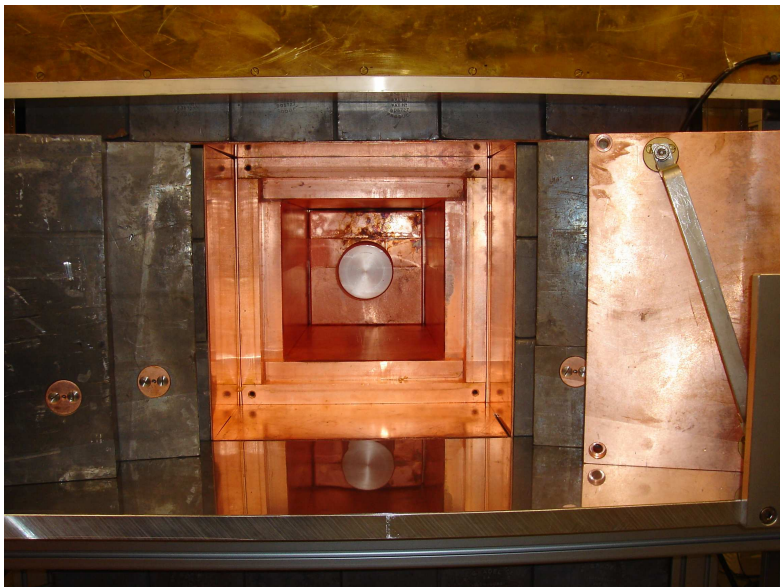
Detector is completely operational, including muon veto shield and N₂ flushing of the sample chamber. Some additional fine-tuning of the electronics is to be done: improve energy resolution and the muon veto efficiency

Monte-Carlo model of the detector is the most detailed and accurate of all Heidelberg detectors because of the X-ray scan and the dead layer and crystal hole characterization measurements performed with ²⁴¹Am, ¹³³Ba, ¹³⁷Cs, ⁵⁴Mn and ⁶⁰Co sources

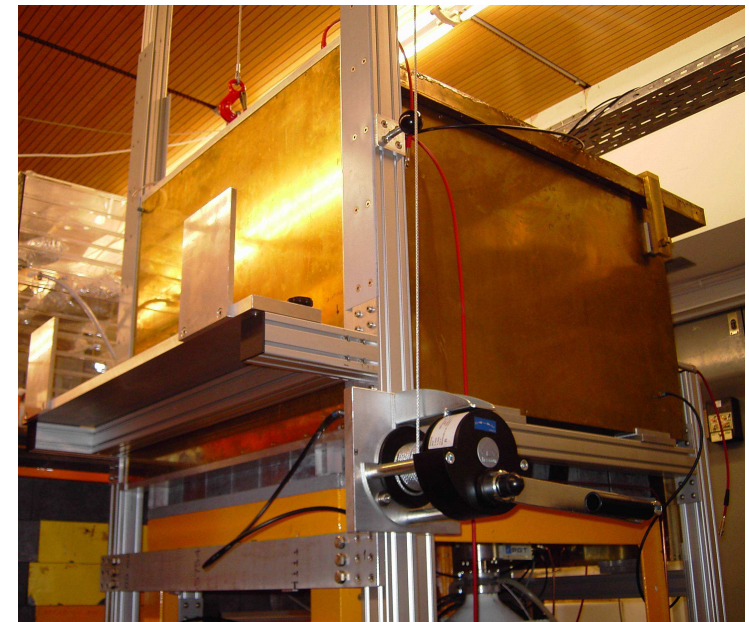
Samples measured:

Lead wire for GeMPI3
NPL solution in bottle
NPL concrete powder
PPO for DoubleChooz

Dusan Budjas
Mark Heisel
Werner Maneschg
Hardy Simgen



Corrado: open sample chamber



Corrado: muon veto shield

Renovation of the Low-Level Lab @ MPIK



Dario, Bruno and Corrado γ spectrometers in the LLL

→ coordinate the distribution of samples for γ -ray screening between LNGS, Hades and Baksan at this meeting

Starting on July 2, the LLL at MPIK will be renovated. This will last for 5 months.

γ -spectrometers and the storage rack for heavy loads (Fe, Cu, Pb) will be protected by wooden cases (detectors will be kept cold)

No γ -ray material screening measurements will be possible in Heidelberg until **December 2007**

In contrast: ^{222}Rn counting setup will be moved into another lab above ground → ^{222}Rn measurements in Ar and emanation measurements will continue in this period



Counters for ^{222}Rn measurements

Radon monitor for GERDA

Stainless steel vessel, inner surface electropolished, volume 710 l, design HV 50 kV

Status at Ringberg Collaboration Meeting:

problems with background from dust particles and HV discharges (at HV > 35 kV)

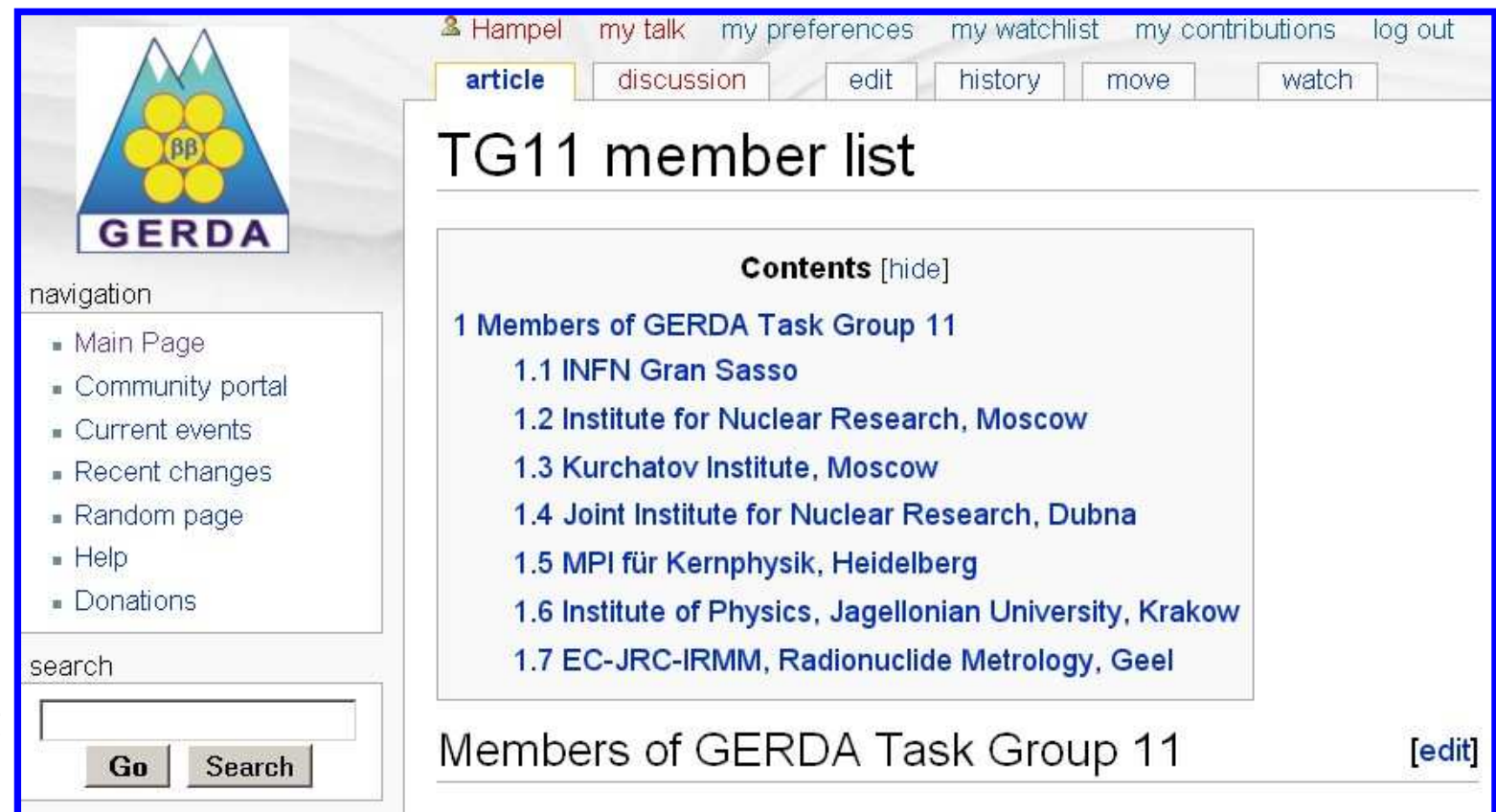


1.5 m

- Cleaning of the inner vessel with:
 - soap and water
 - deionized water
 - hot quartz distilled water→ done
- Modification of the insulator setup → under way
- Electronic improvements for background reduction → under way
- Calibration with a known amount of ^{222}Rn → to be done

GERDA Wiki

For all members of TG11: use the TG11 section on the GERDA Wiki pages as a forum to exchange information



The screenshot shows a Wikipedia-style page for 'TG11 member list'. At the top, there is a user profile for 'Hampel' with links for 'my talk', 'my preferences', 'my watchlist', 'my contributions', and 'log out'. Below this are navigation tabs: 'article', 'discussion', 'edit', 'history', 'move', and 'watch'. The main heading is 'TG11 member list'. Underneath is a 'Contents [hide]' section with a list of links: '1 Members of GERDA Task Group 11', '1.1 INFN Gran Sasso', '1.2 Institute for Nuclear Research, Moscow', '1.3 Kurchatov Institute, Moscow', '1.4 Joint Institute for Nuclear Research, Dubna', '1.5 MPI für Kernphysik, Heidelberg', '1.6 Institute of Physics, Jagellonian University, Krakow', and '1.7 EC-JRC-IRMM, Radionuclide Metrology, Geel'. At the bottom of the page, there is a section titled 'Members of GERDA Task Group 11' with an '[edit]' link.

In order to obtain an account go to:

<http://www.mpi-hd.mpg.de/ge76/internal/> →

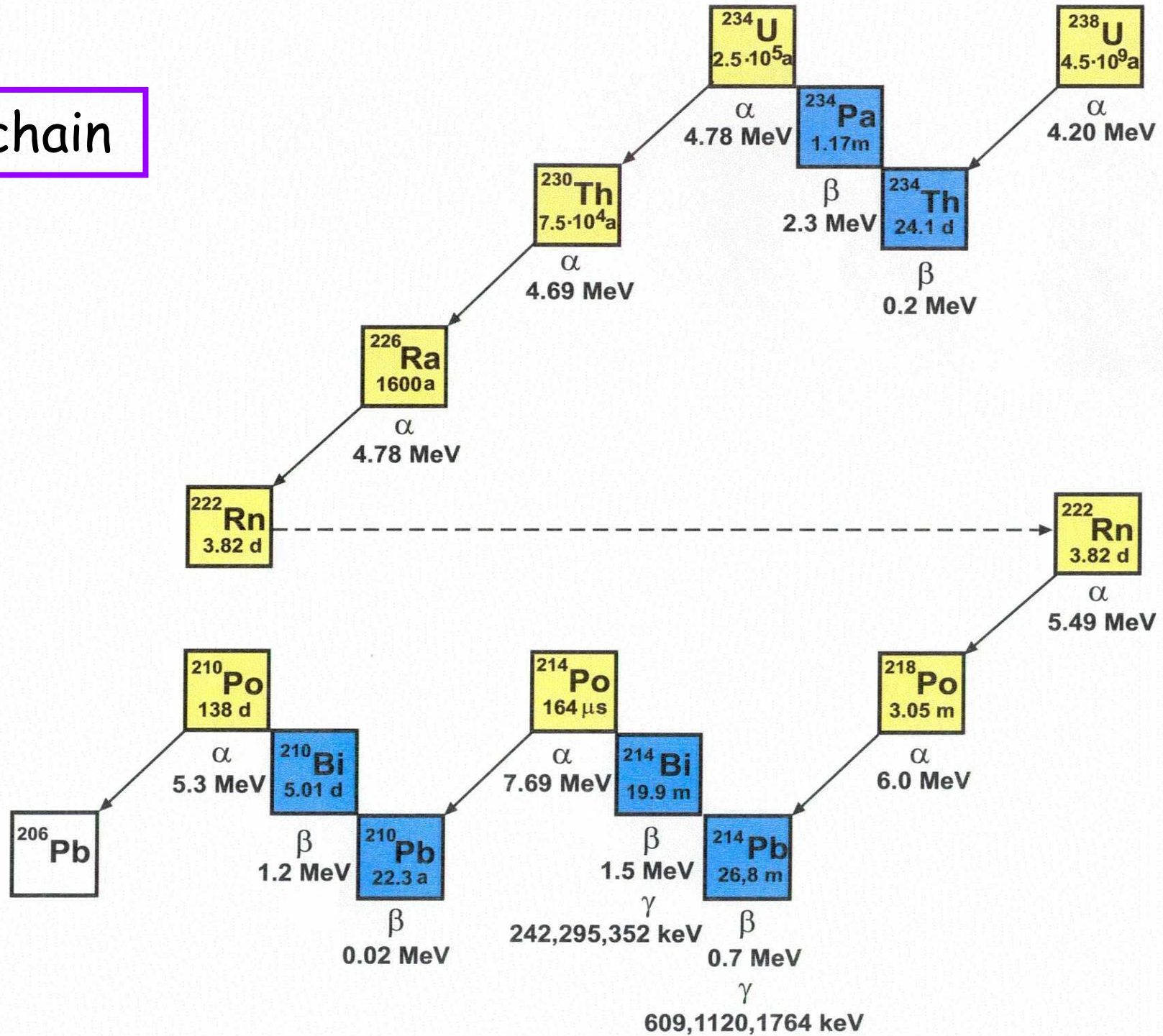
Internal GERDA documents

[GerdaWiki](#)

If you do not have an account for the GerdaWiki, please contact [Ingrid.Black \(at\) mpi-hd.mpg.de](mailto:Ingrid.Black@mpi-hd.mpg.de)

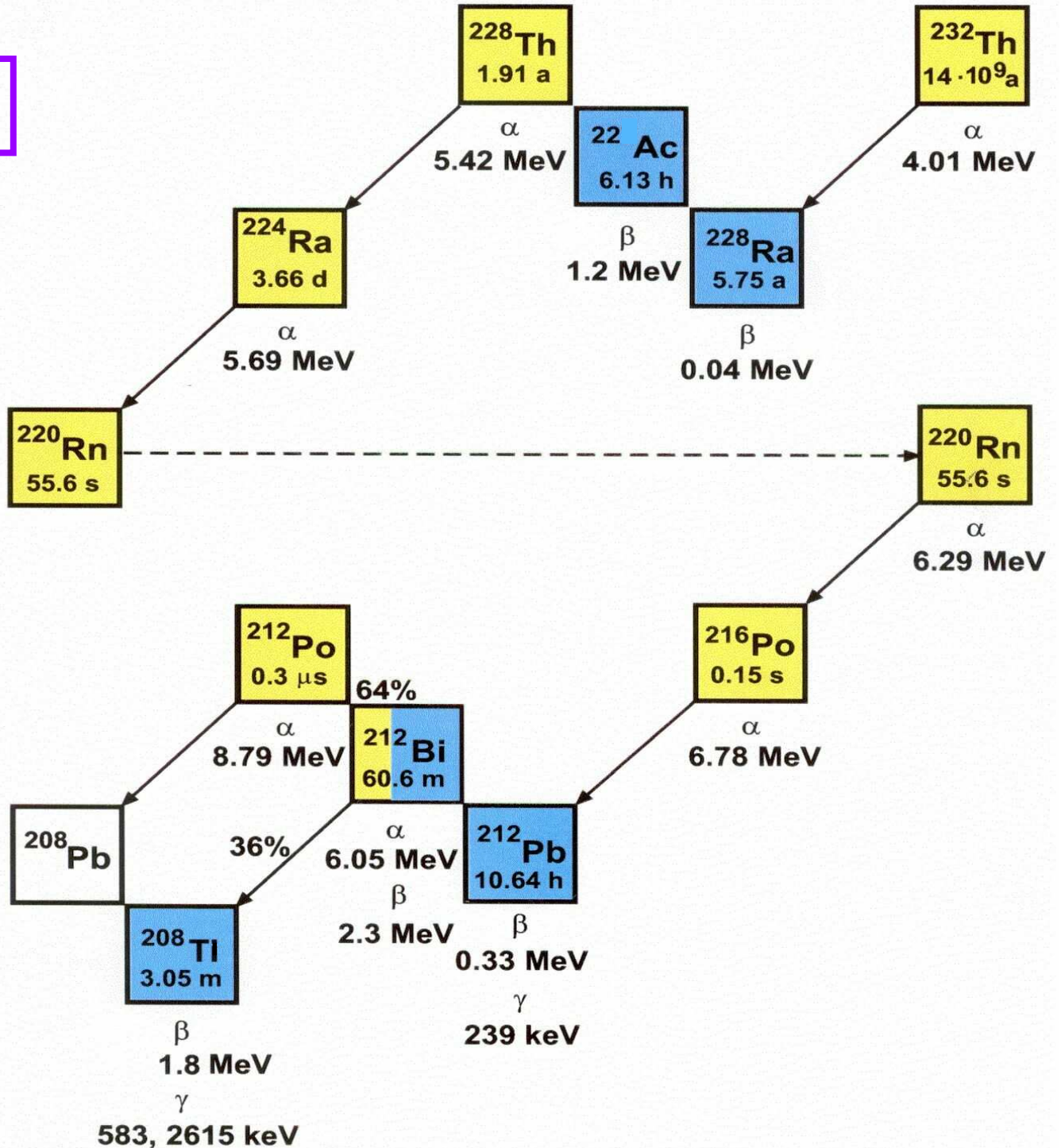


^{238}U decay chain



232Th decay chain

Activity ratio $^{228}\text{Th}/^{232}\text{Th}$
must be > 0.7





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GERDA Collaboration Meeting
Geel, June 11-13, 2007



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