



# Gamma-ray Spectrometry

QA, Intercomparisons, proficiency testing

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# Obligatory slide

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# Outline

- **QA/QC measures for gamma spectrometry**
- **PT as a QC tool**
- **List of PTs**
- **Intercomparisons**



## QC & maintenance HPGe

- *Regular QC checks (daily/weekly/when changing sample) with reference source*
- *Log E-cal., FWHM, and possibly efficiency*
- *Measure background regularly and keep a log of it, both peak count rates as well as integrated count rate.*
- *Log leakage current and LN<sub>2</sub> consumption (weekly)*
- *Thermal cycle once per year – or more seldom (and clean Dewar)*



## QC & maintenance HPGe

- *Keep cool at all times* (to avoid diffusion and increased deadlayers)
- *No H.V. unless cool* – longer time to cool/heat for a big crystal
- *Pump the cryostat when necessary !! (every XX year)*  
*can vary from one detector to another depending on how good the vacuum seal is.*
- *Remove ice from Dewar*
- *It is worth repairing an old (underground) detector!!*  
*– a “big bad” detector is still valuable*



# Proficiency testing

- *The best way of checking that you measure well.*
- *Try to participate at least once per year*
- *Important with follow up with corrective and preventive actions in case of poor results*
- *Many to PTs to choose from*
- *In a good PT, the reference value is determined using a primary method with very low uncertainty.*



# List of regular PT schemes

*To be added.....*

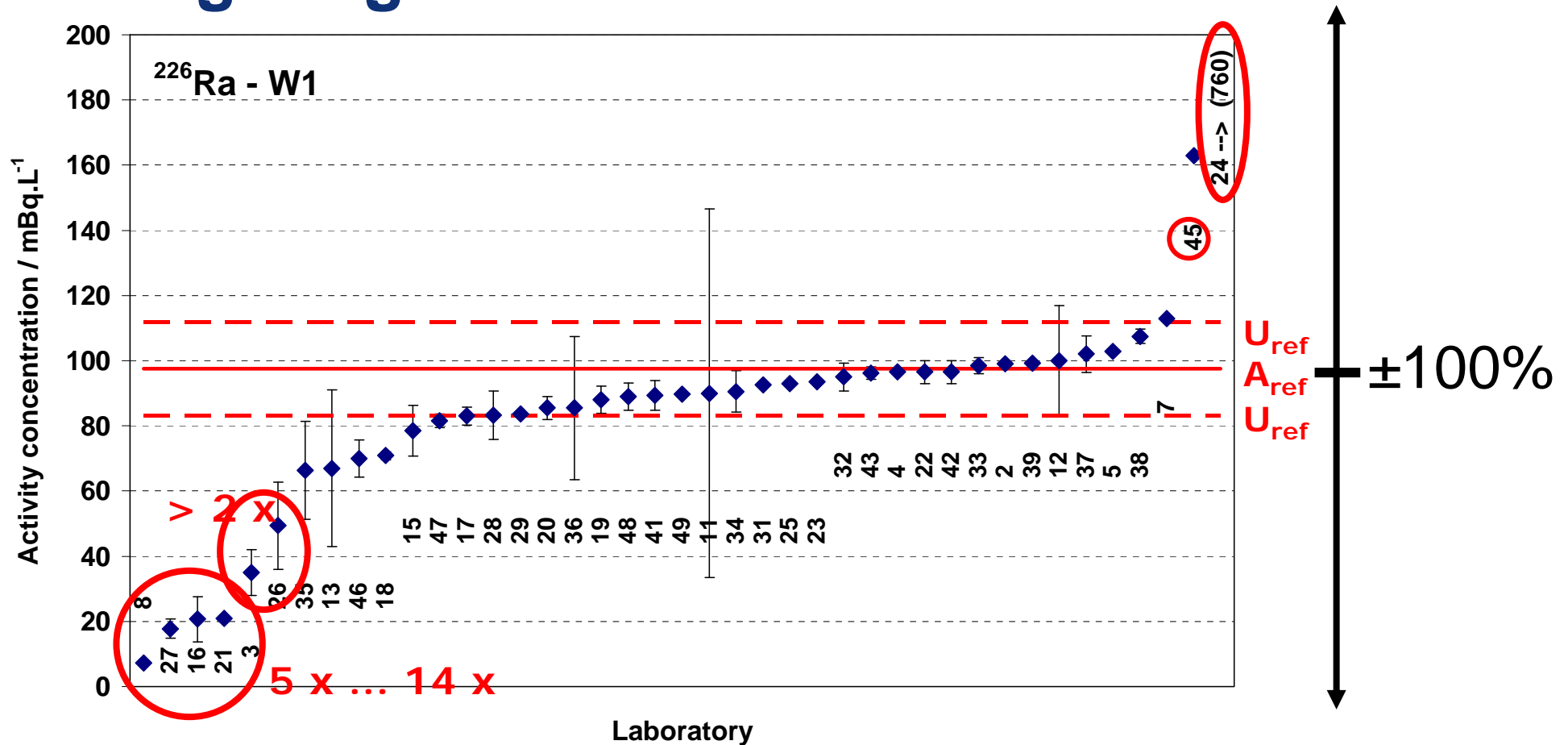
# Proficiency testing

Vinča Institute of Nuclear Sciences,  
Belgrade, Serbia, 13-15 November, 2012



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## Getting it right is far from trivial !



- Effective legislation depends on accurate measurements
- IRMM provides the tools to measure properly and in a harmonised way





## **IRMM is organising Proficiency Testing for nominated European laboratories monitoring radioactivity in the environment**

- $^{137}\text{Cs}$  in air filters (2007)
- $^{137}\text{Cs}$ ,  $^{40}\text{K}$ ,  $^{90}\text{Sr}$  in milk powder (2008)
- $^{226}\text{Ra}$ ,  $^{228}\text{Ra}$ ,  $^{234}\text{U}$ ,  $^{238}\text{U}$  in mineral waters (2010)
- Radionuclides in soil, among them several NORM (2011)
- $^{137}\text{Cs}$ ,  $^{40}\text{K}$ ,  $^{90}\text{Sr}$  in bilberry powder (2011-2012;
- Gross alpha and beta activity in water (2012-2013)



# Intercomparisons

*Where a sample is either (i) circulated amongst the participants or (ii) aliquots of a mother solution (sample) is sent to the participants and the results are compared with each other and not with a reference value.*