



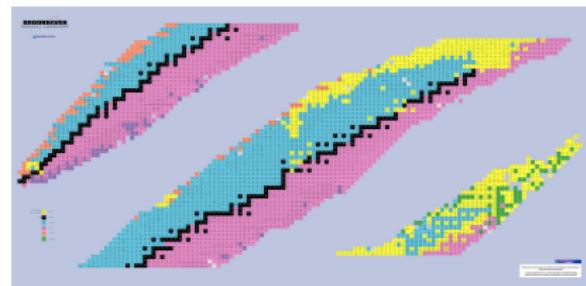
JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

Decay Spectroscopy Measurement at IGISOL



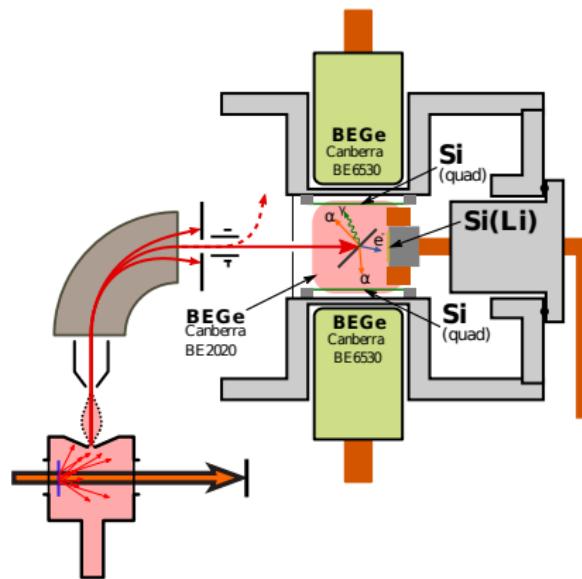
Introduction

- Physics Case
- Experimental Setup
- Preliminary Efficiency Test



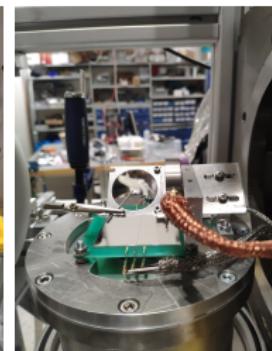
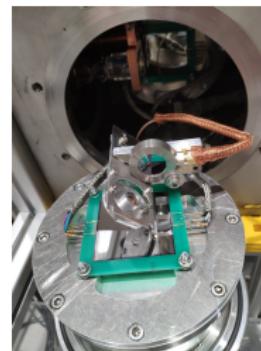
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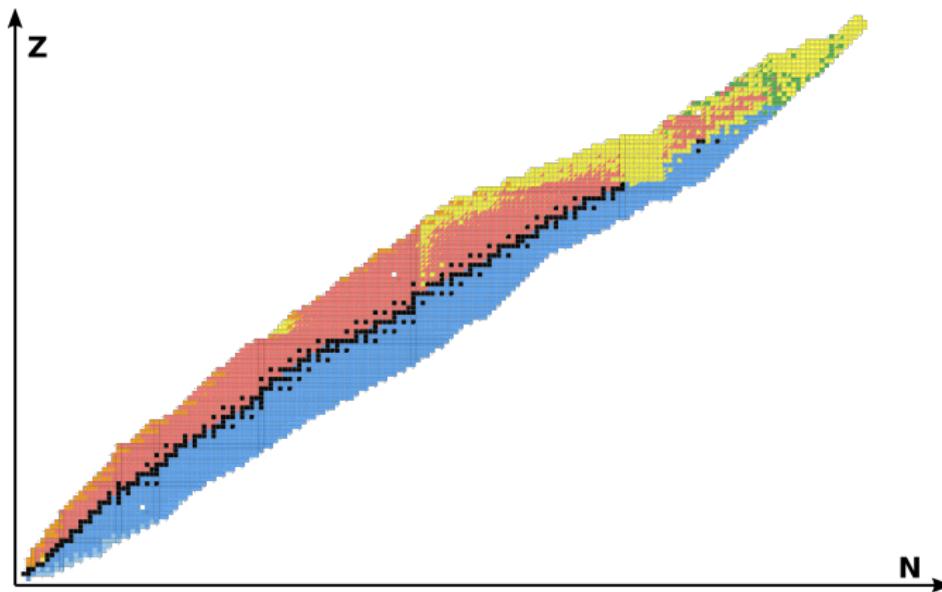


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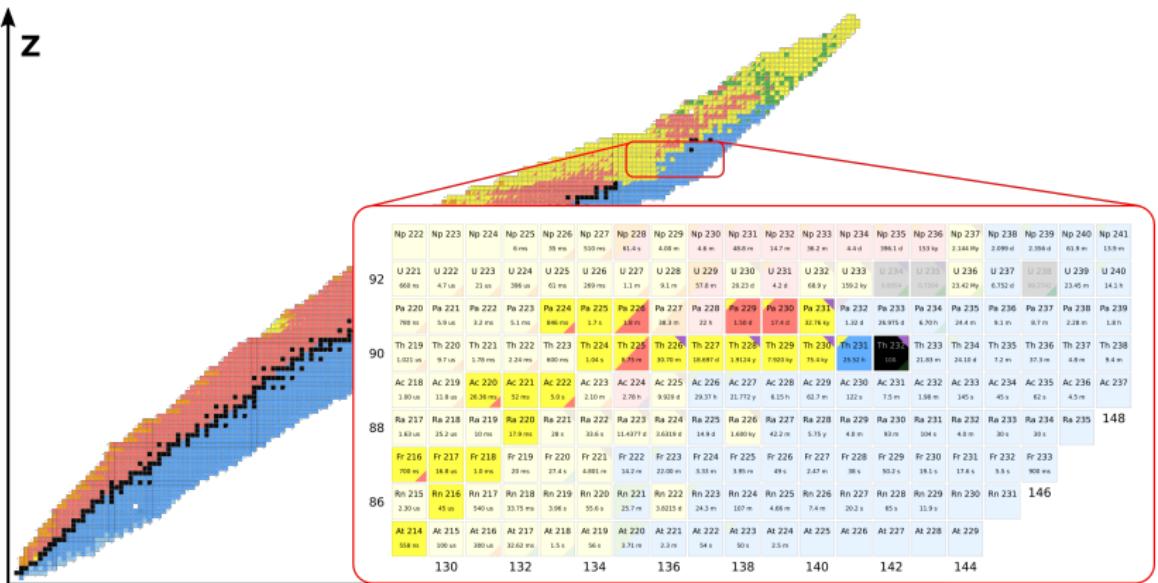
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Motivation

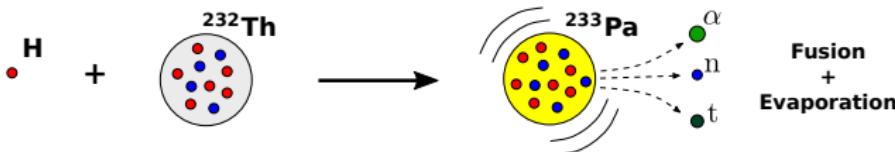


Motivation

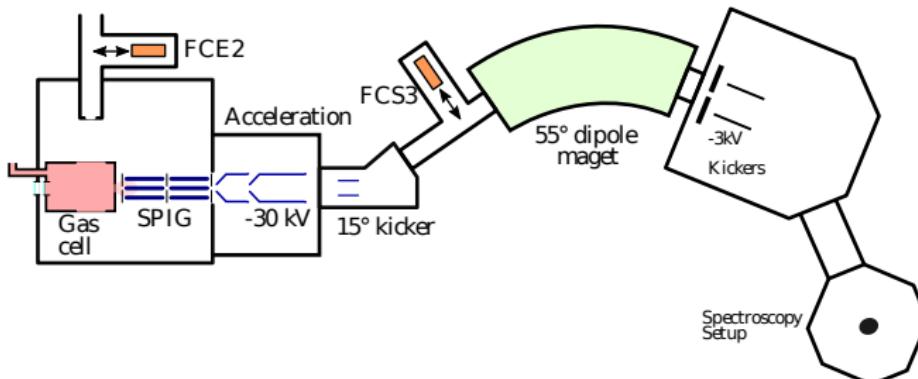


Reaction

BEAM TARGET

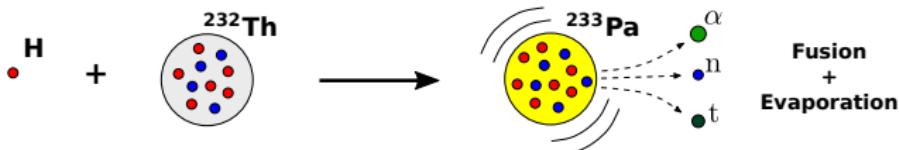


- 65 MeV Hydrogen Beam on ^{232}Th target
- Evaporated residual extracted, selected and implanted on Carbon foil at spectroscopy setup.

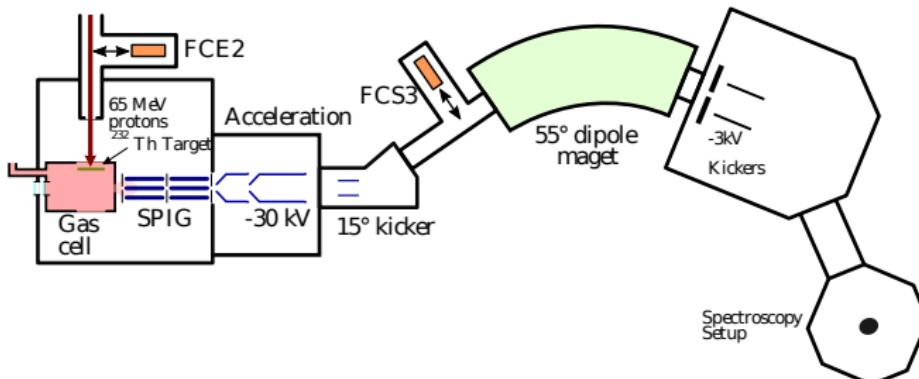


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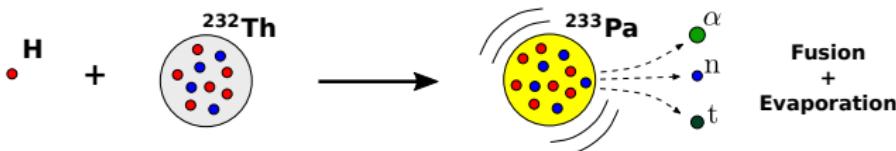


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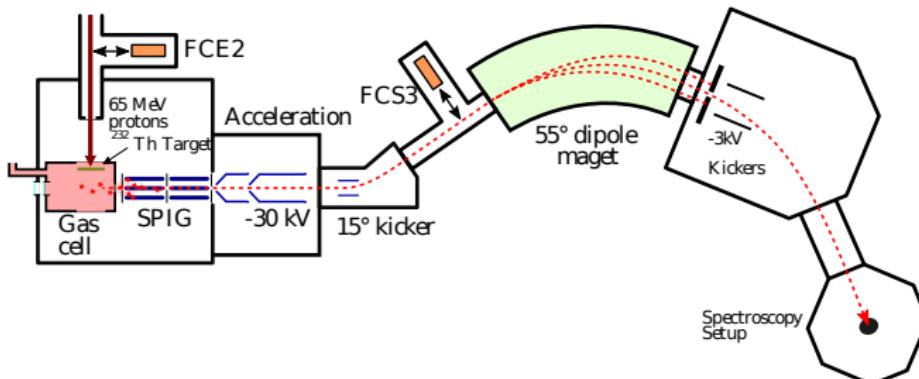


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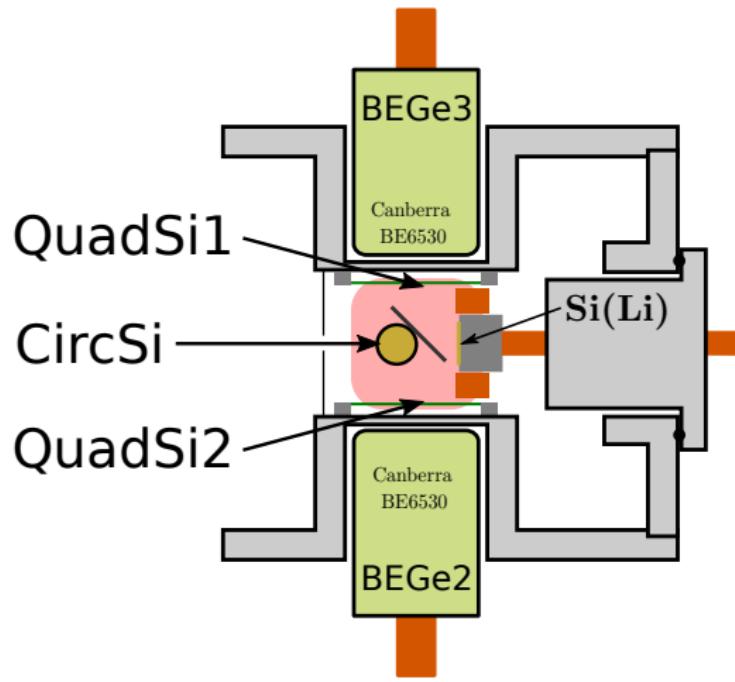


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Decay Station

- 1 → BEGE2020
- 3 → BEGE6530
- 2 → QuadSi
- 1 → CircSi
- 1 → Si(Li)



Detection Efficiency of the different detectors

1 → 3- α source

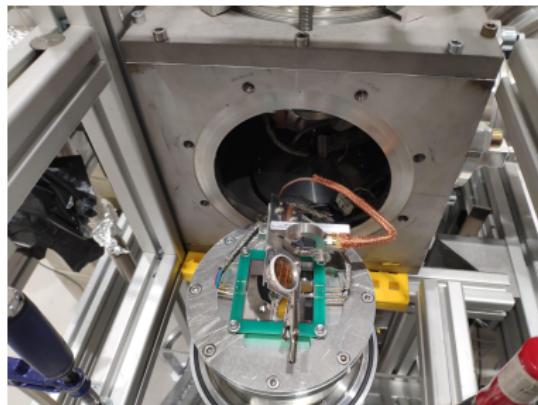
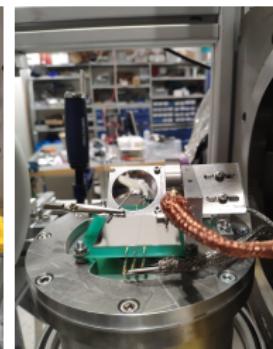
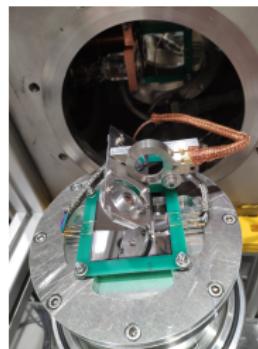
^{239}Pu - ^{241}Am - ^{244}Cm

5 → γ sources

^{133}Ba - ^{210}Pb - ^{60}Co

^{137}Cs - ^{152}Eu

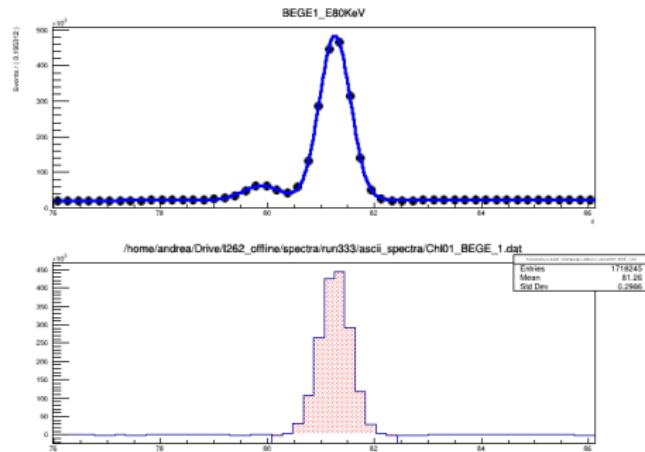
Sources



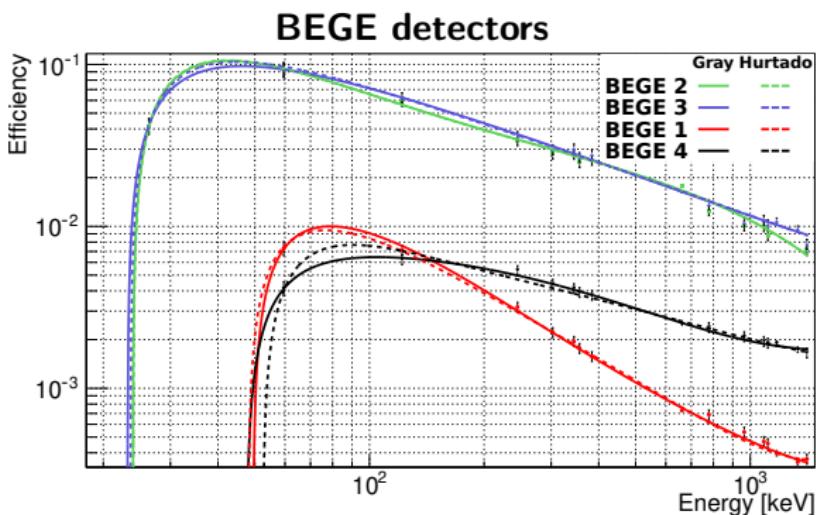
Method

$$\mathcal{E}_{\text{ABS}} = \frac{\text{Peak Area}}{\text{Time} \times \text{Activity} \times \text{Intensity}}$$

- Peak Area
- Time
- Activity
- Intensity



Results



$$\begin{aligned} {}^1\mathcal{E}_{\text{ABS}}(E) &= a_1 (\exp(-a_2 E^{a_3}) + \exp(-a_4 E^{a_5})) (1 - \exp(a_6 E^{a_7})) \\ {}^2\mathcal{E}_{\text{ABS}}(E) &= \frac{1}{E} \sum_i a_i (\ln(E))^{i-1} \end{aligned}$$

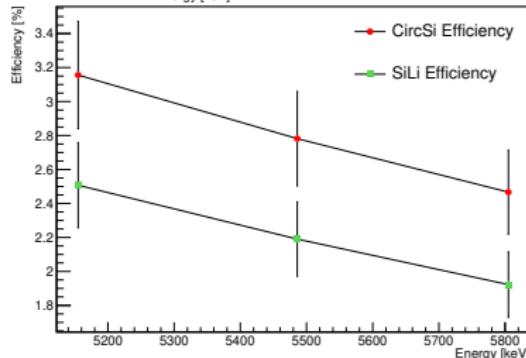
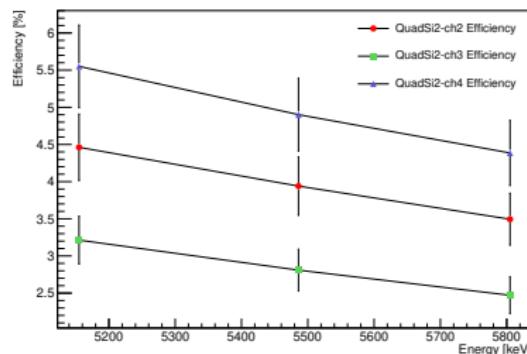
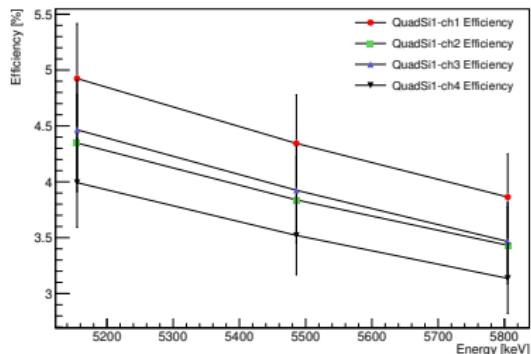
¹Hurtado Garcia-Lenon Nucl. Instr. and Meth. A 594 (2008) 362–367

²P.W. Gray, A. Ahmad, Nucl. Instr. and Meth. A 237 (1985) 577



Results

Silicon Detectors





Summary

- Efficiency in agreement with the expected values
- Compare Si detectors efficiency from ^{223}Ra recoil source
- Start analysis of first experimental isobar at A=227