

In-beam spectroscopy of ^{253}No

Philippos Papadakis

The University of Liverpool

4 April 2011



UNIVERSITY OF
LIVERPOOL

1 Physics Motivation

2 Experimental details-Results

3 Future work

4 Summary

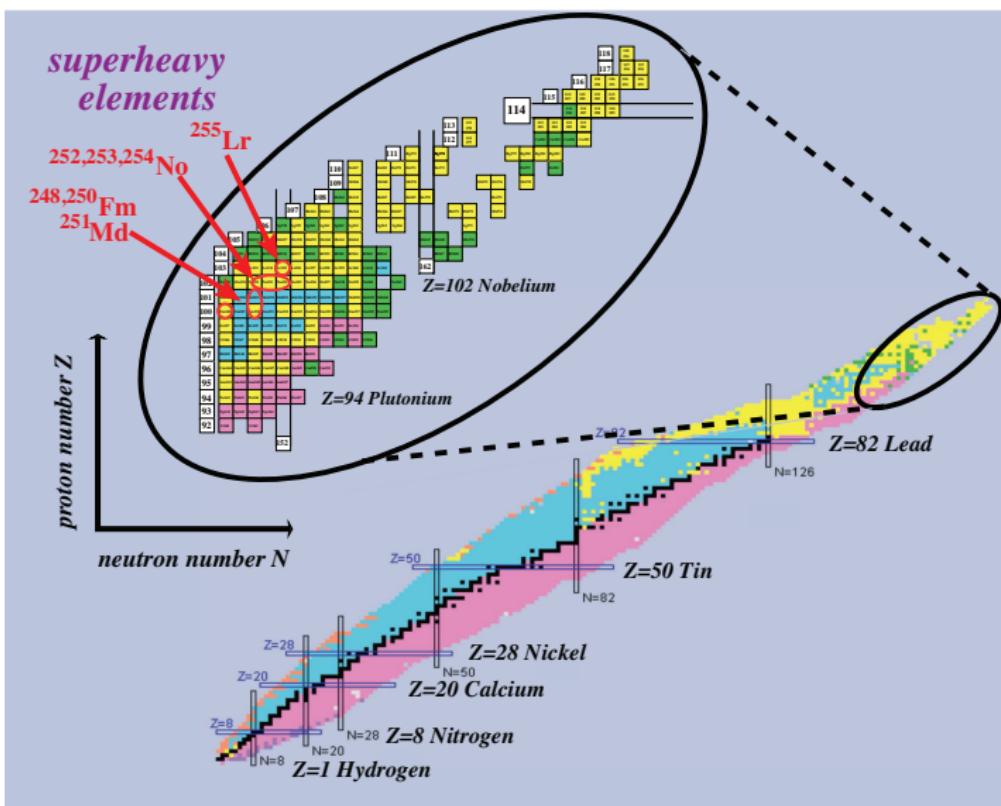
1 Physics Motivation

2 Experimental details-Results

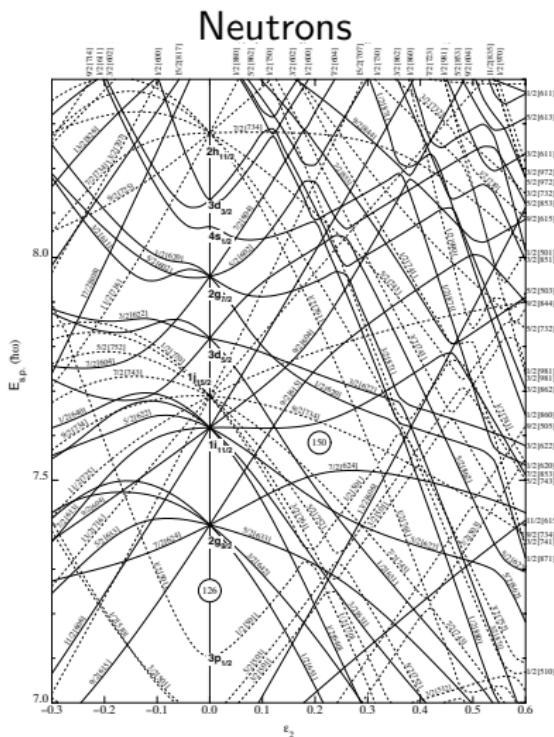
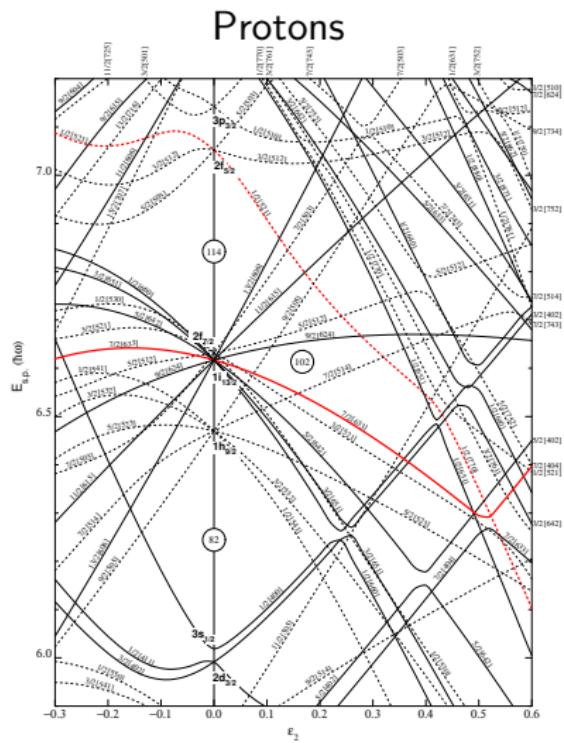
3 Future work

4 Summary

Physics Motivation

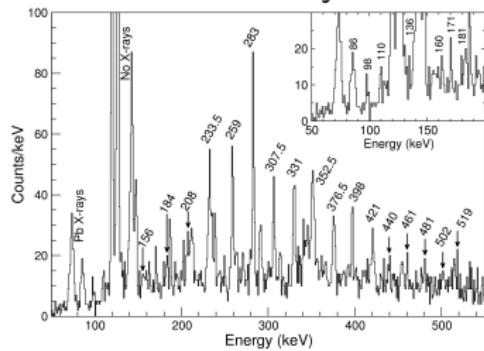


Physics Motivation

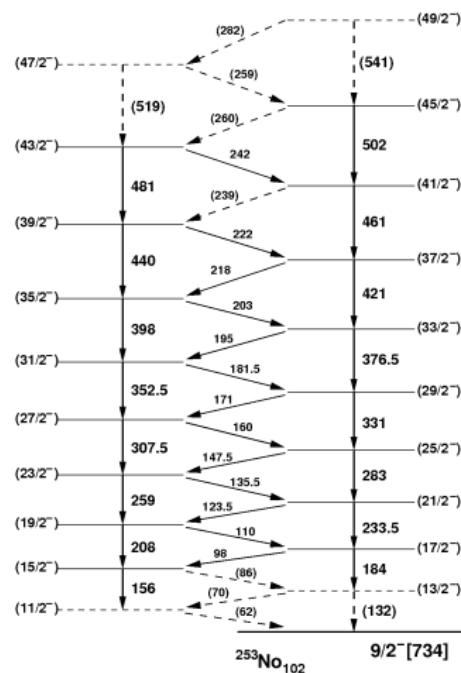
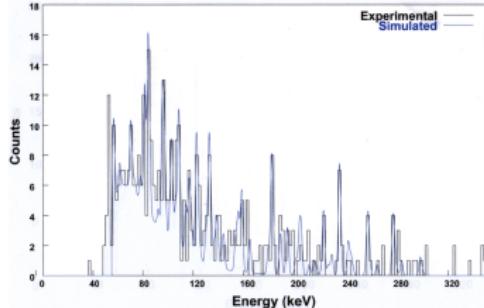


Previous experiments

Gamma rays



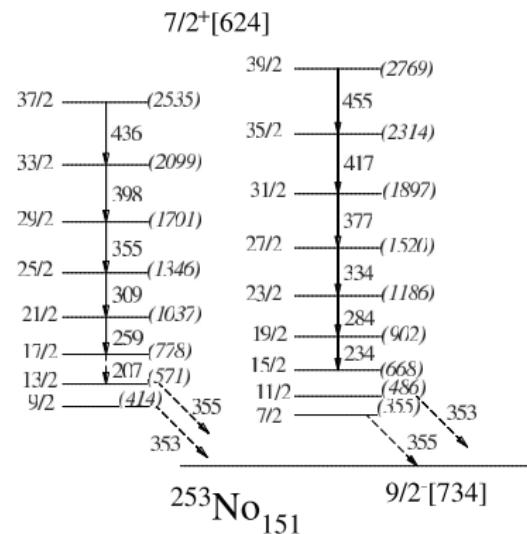
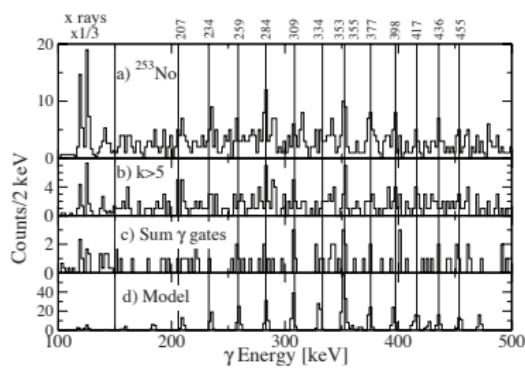
Internal conversion electrons



R.-D. Herzberg *et al.*, Eur.Phys.J. A **15**, 205 (2002)

R.-D. Herzberg *et al.*, Eur.Phys.J. A **42**, 333 (2009)

Previous experiments



1 Physics Motivation

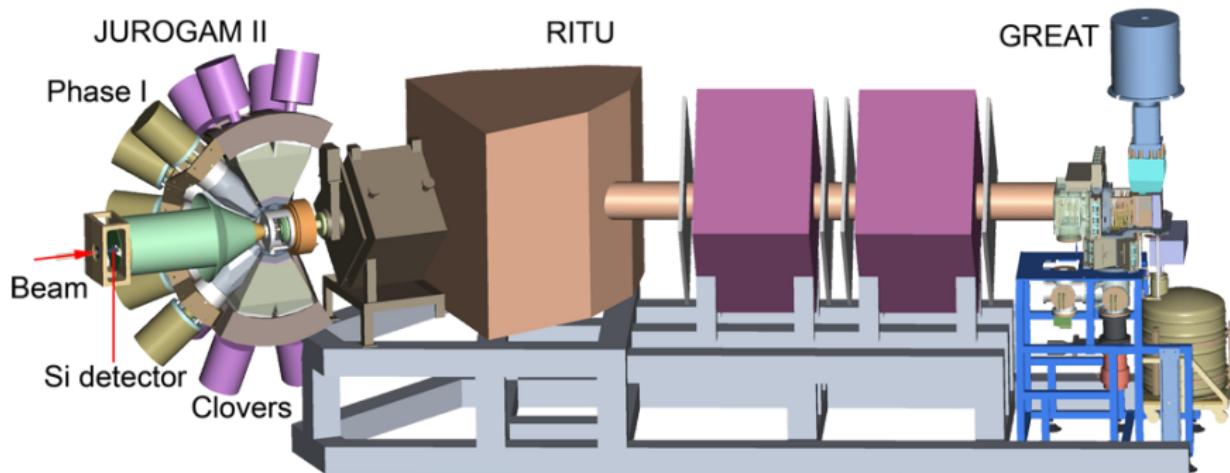
2 Experimental details-Results

3 Future work

4 Summary

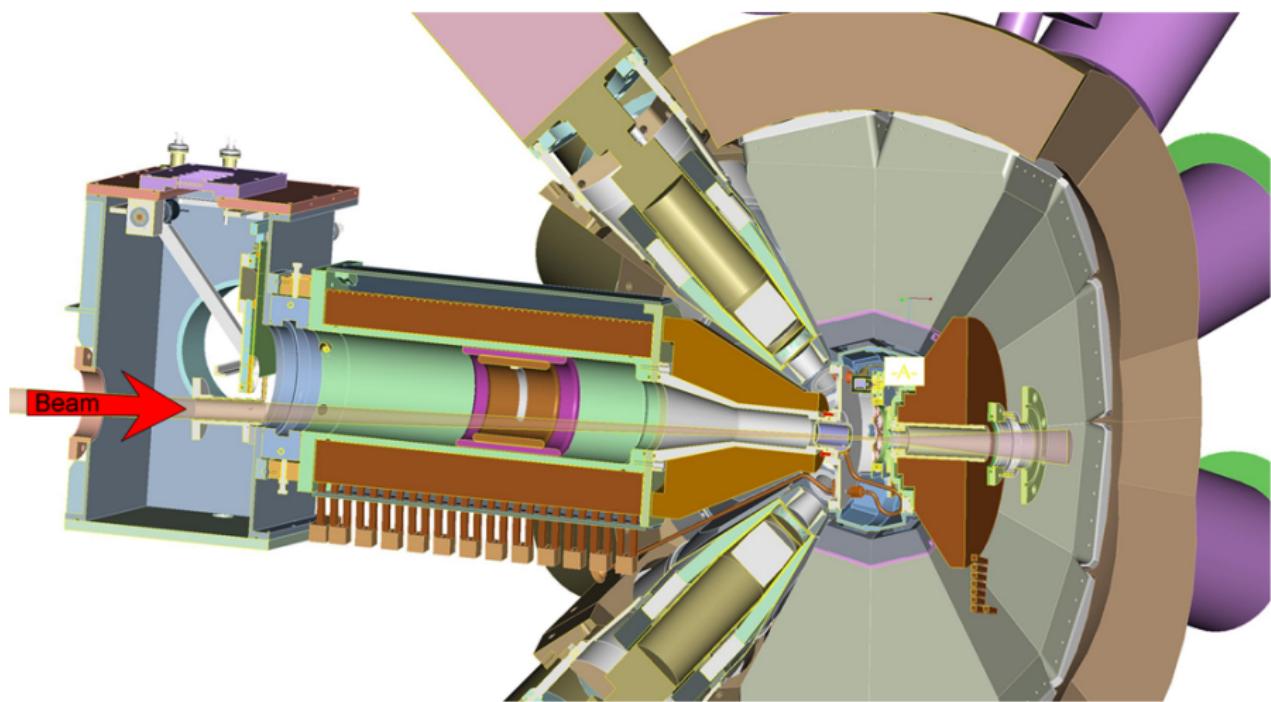
Experimental Setup

S(ilicon) A(nd) GE(rmanium) spectrometer



Employing **fully digital** electronics

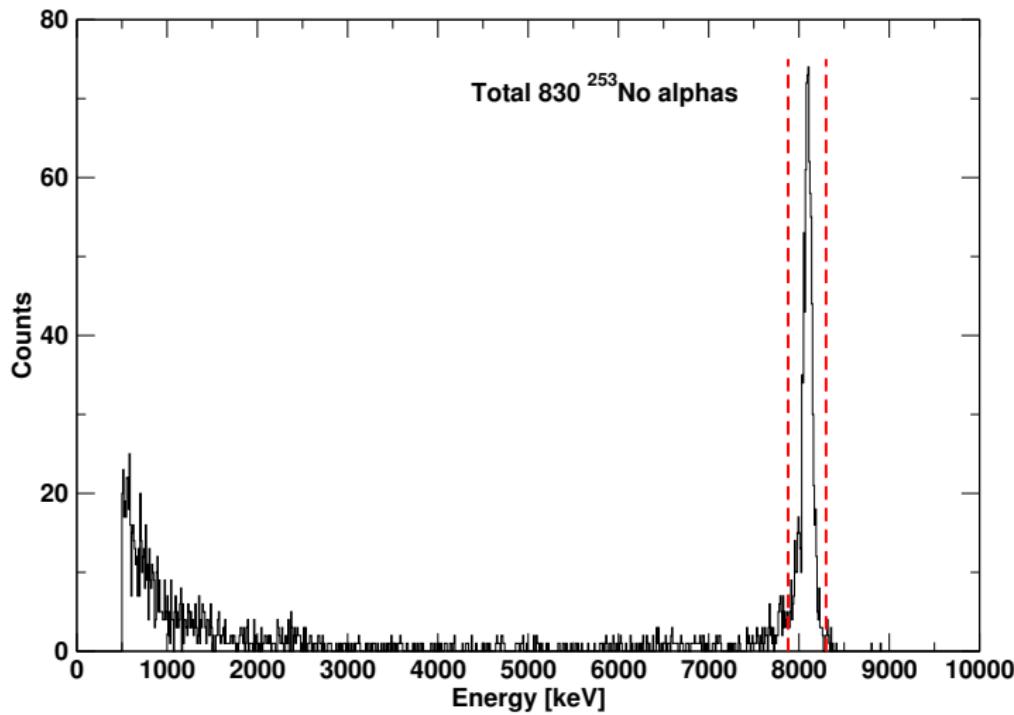
Experimental Setup



$^{207}\text{Pb}(\text{Ca},2\text{n})^{253}\text{No}$ @ 219 MeV

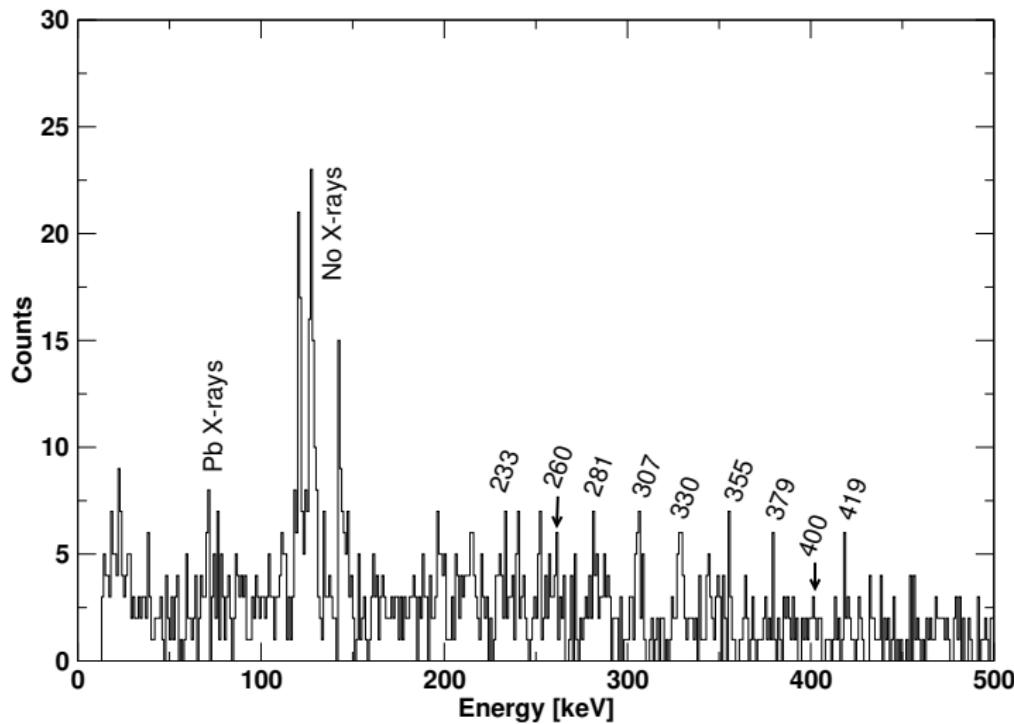
$\sigma = 1 \mu\text{b}$

^{253}No alpha spectrum

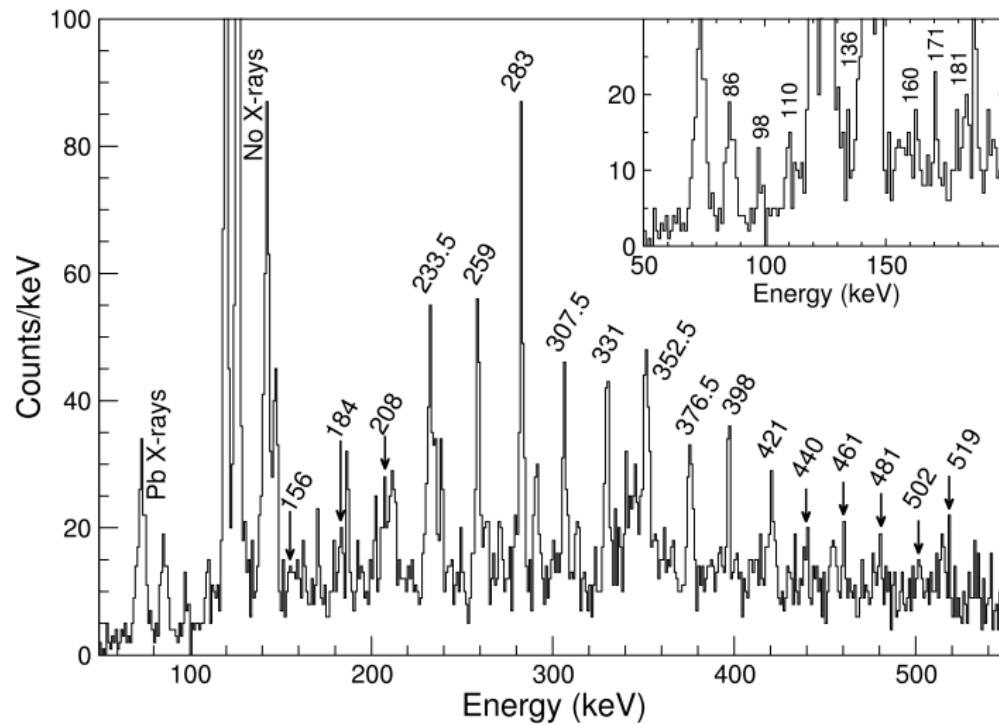


In R.-D. Herzberg *et al.*, Eur.Phys.J. A **42**, 333 (2009) total of 11400 alphas

^{253}No γ -ray spectrum



^{253}No γ -ray spectrum



1 Physics Motivation

2 Experimental details-Results

3 Future work

4 Summary

Future work

- Rerun the experiment with SAGE

Future work

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC

Future work

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues

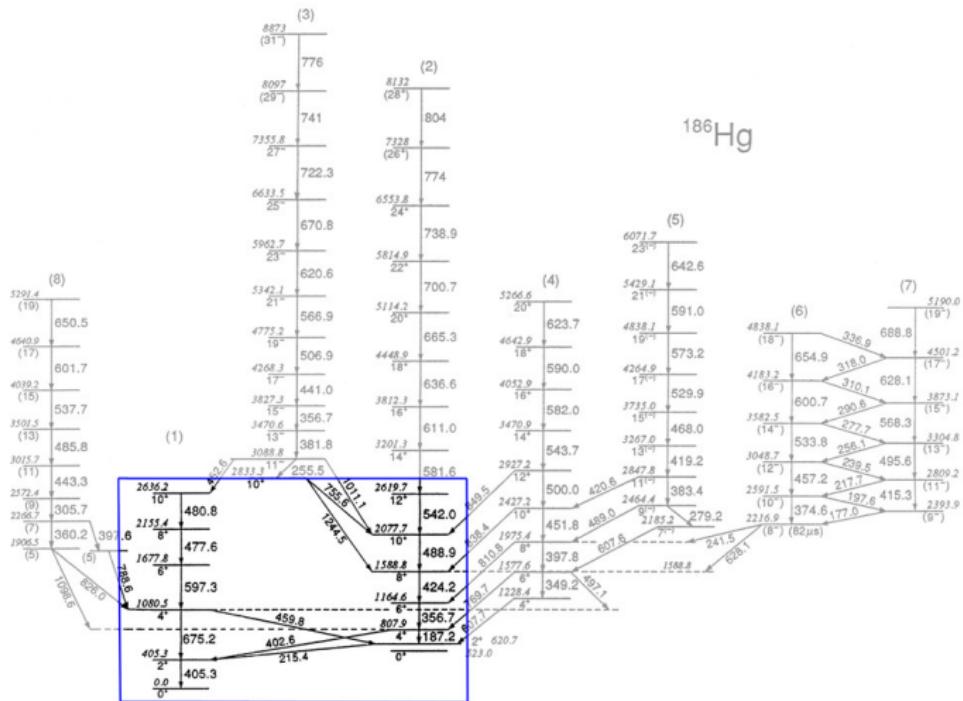
Future work

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues
- Optimise SAGE

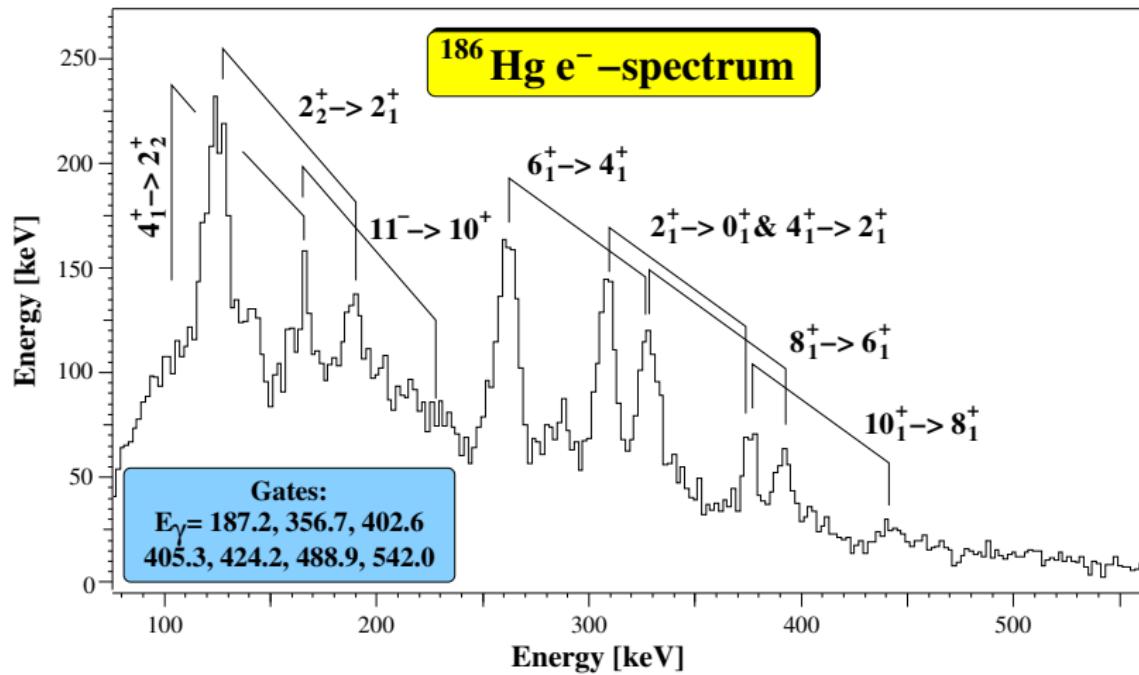
Future work

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues
- Optimise SAGE
- But...

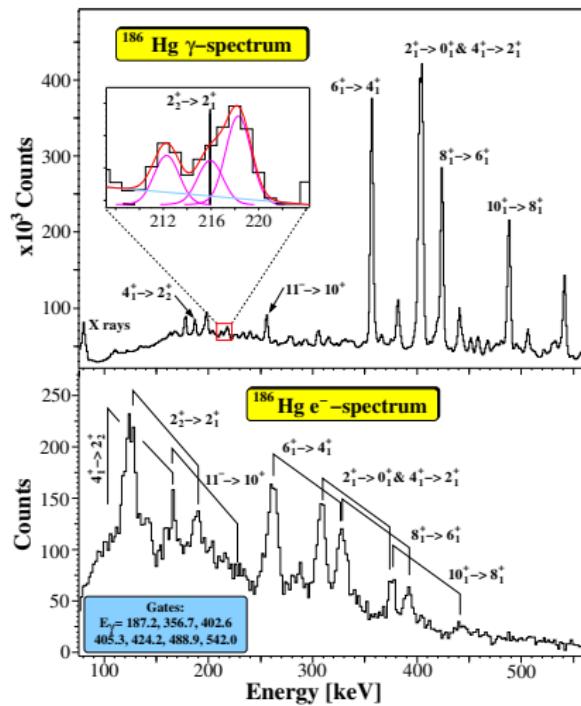
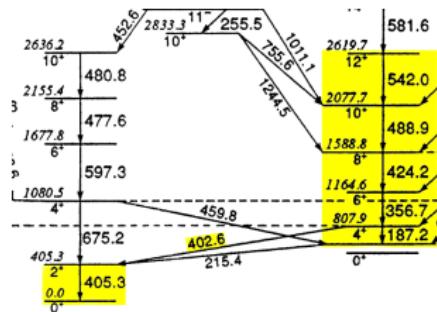
^{186}Hg SAGE experiment



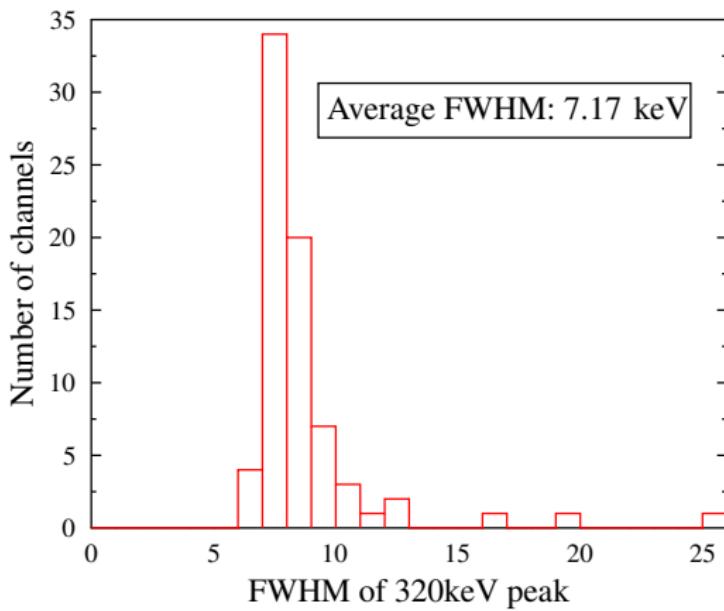
^{186}Hg - Gates on yrast transitions



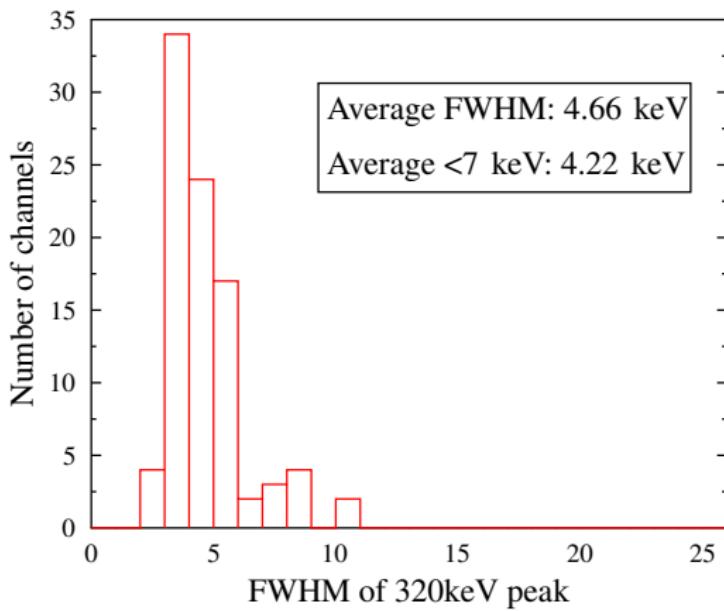
^{186}Hg - E0 detection



Status of detector during Hg run



Status of detector after optimisation



1 Physics Motivation

2 Experimental details-Results

3 Future work

4 Summary

Summary

- Rerun the experiment with SAGE

Summary

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC

Summary

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues ✓

Summary

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues ✓
- Optimise SAGE ✓

Summary

- Rerun the experiment with SAGE
- Proposal for rerun accepted by Jyväskylä PAC
- Address water-cooling issues ✓
- Optimise SAGE ✓
- Check for isomers at focal plane

Collaboration

University of Liverpool, UK

P. Papadakis, R.-D. Herzberg, D. Cox, A. Mistry

University of Jyväskylä, Finland

P.T. Greenlees, T. Grahn, K. Hauschild, A. Herzáň, U. Jakobsson,
P. Jones, R. Julin, S. Juutinen, S. Ketelhut, M. Leino, A. Lopez-Martens,
P. Nieminen, P. Peura, P. Rahkila, S. Rinta-Antila, P. Ruotsalainen,
M. Sandzelius, J. Sarén, C. Scholey, J. Sorri, J. Uusitalo

DAPNIA/SPhN, CEA-Saclay

Fabien Déchery

