Gamma ray spectroscopy with the Notre Dame radioactive beam facility

S. M. Vincent, A. A. Aprahamian, J. J. Kolata, V. Guimaraes, R. C. de Haan, D. Peterson, P. Santi, A. Teymurazyan, F. D. Becchetti, M. Y. Lee, T. W. O'Donnell, D. A. Roberts, J. A. Brown, J. Zimmerman

Gamma ray Spectroscopy with the Notre Dame Radioactive beam facility

Stuart Vincent
University of Surrey

Phase I Produce RIB
Phase II Reduce background
Phase III Increase Ge + PID

ACS Washington 2000

NOTRE DAME
nuclear structure laboratory

Notre Dame Radioactive Beam Facility
10 MV Tandem + TWINSOL Superconducting magnets

RNB	Production	Reaction Studied
^{6}He	^{9}Be(^{7}Li,^{6}He)	Elastic scattering from ^{9}Be, ^{12}C, Ni, Au
^{8}Li	^{9}Be(^{7}Li,^{8}Li)	Coulex of ^{8}Li
^{8}B	^{6}Li(^{3}He,n)^{8}B	^{8}B breakup on natural Ni target
^{18}Fm	^{12}C(^{17}O,^{18}F)	production of isomeric RNB
^{8}He	^{8}Li(t,^{3}He) ^{8}He	elastic and inelastic scattering
^{3}H		
^{7}Be		
^{12}N		

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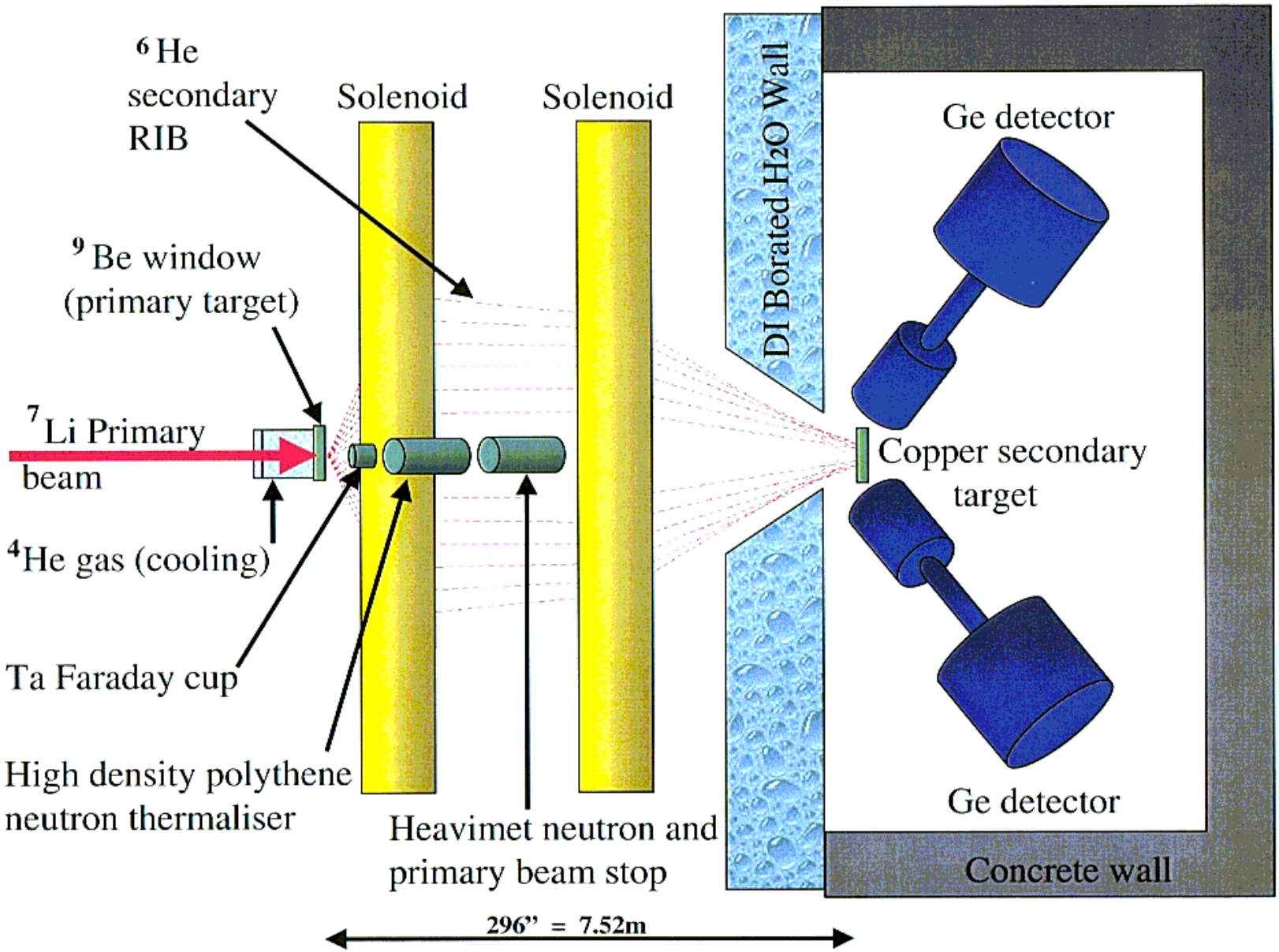
^{6}He secondary RIB
Solenoid
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DI Borated H2O Wall
Ge detector
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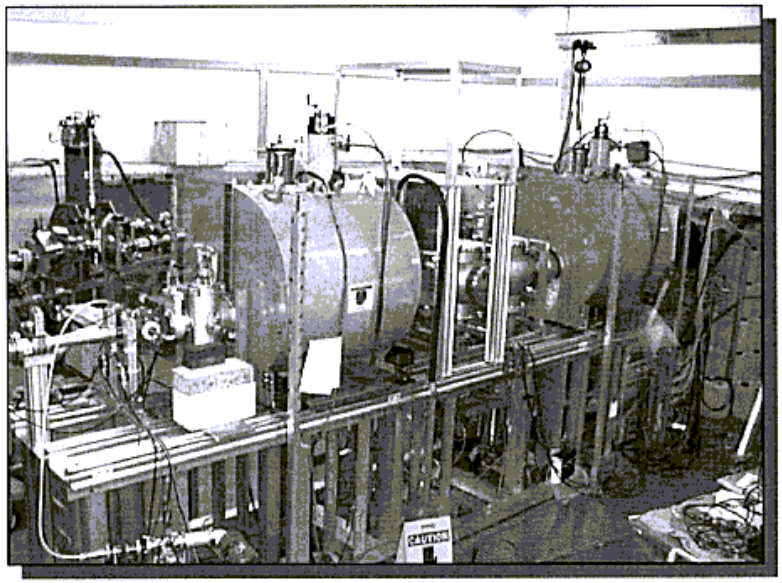
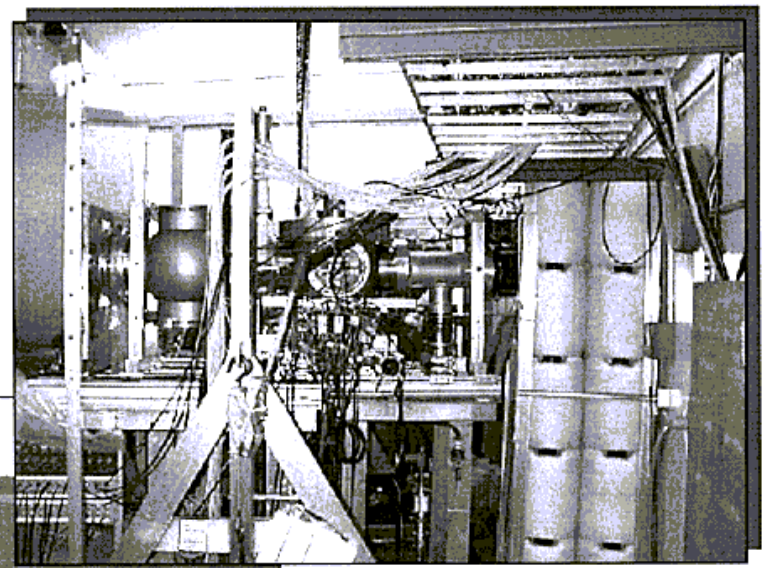
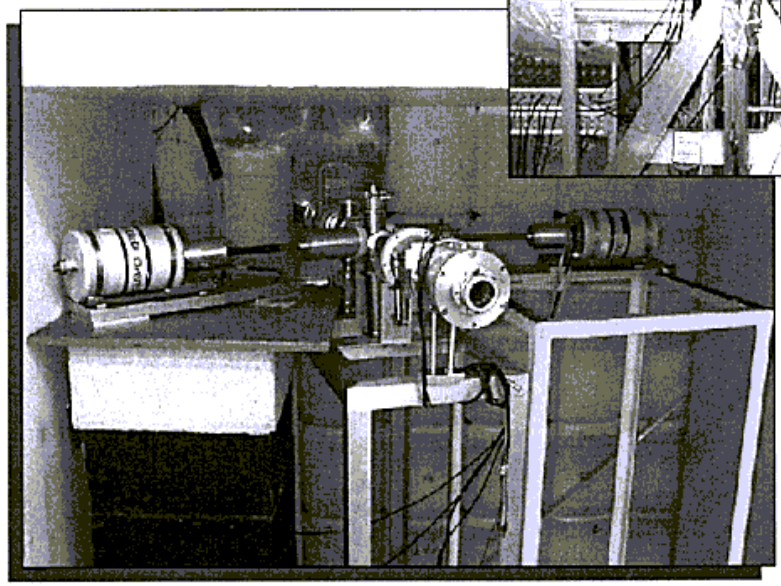
Ta Faraday cup
High density polythene neutron thermaliser
Heavimet neutron and primary beam stop
Ge detector
Concrete wall
296" = 7.52m



Twinsol magnets
(beam separation)



Water wall
(neutron block)



Ge detectors
(spectroscopy)

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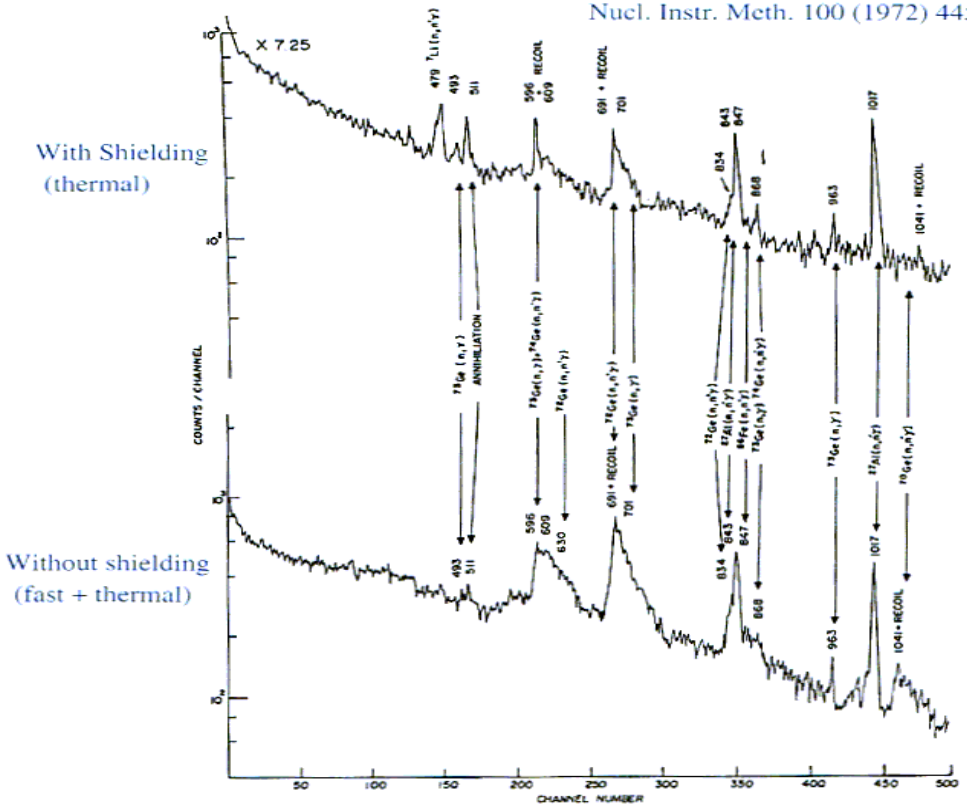
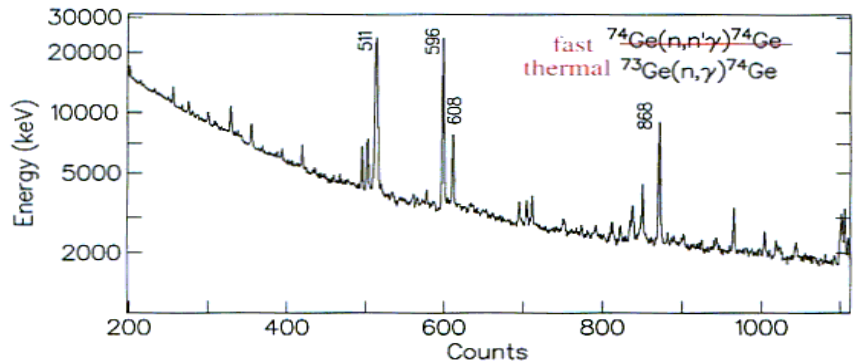
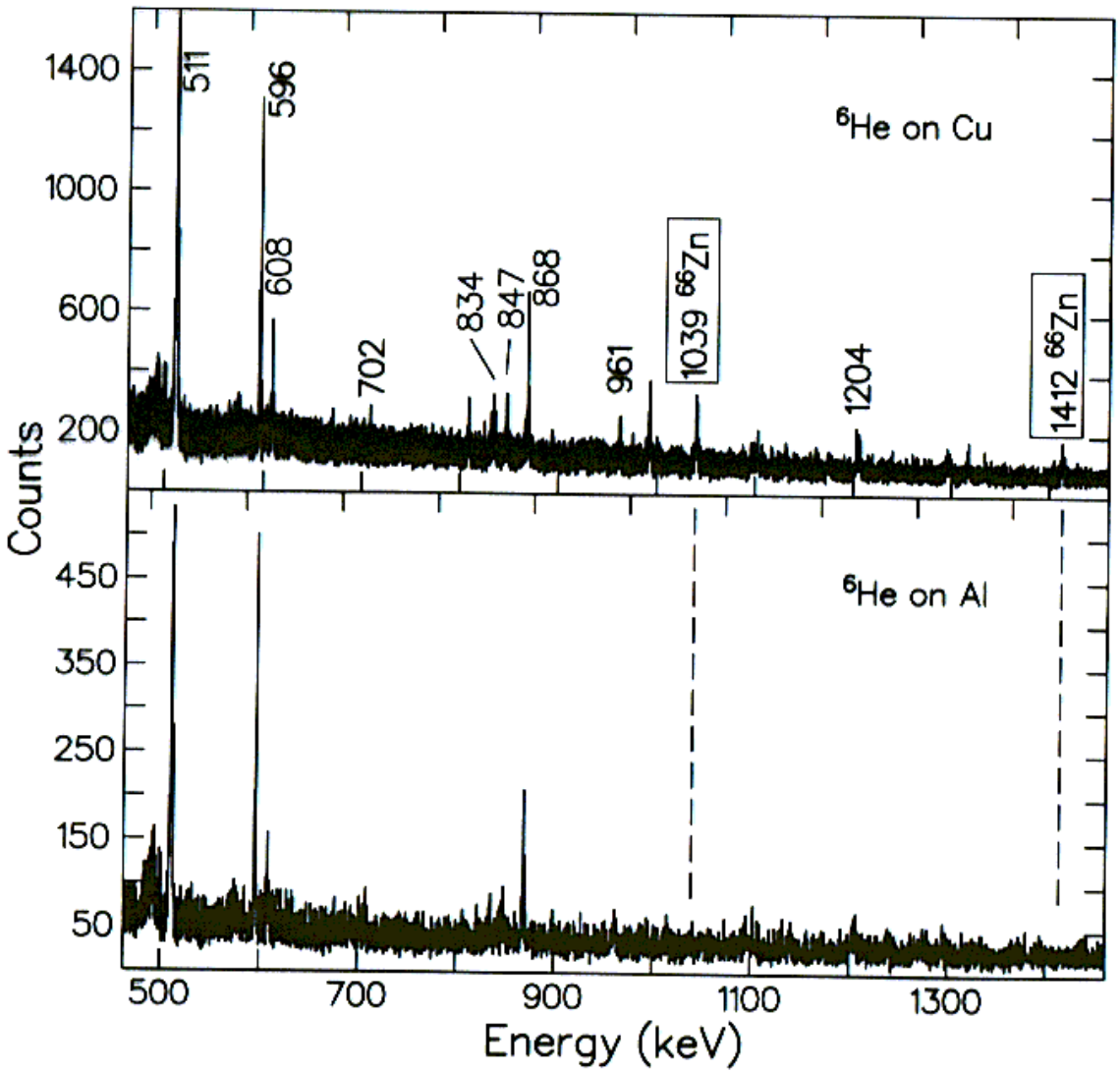
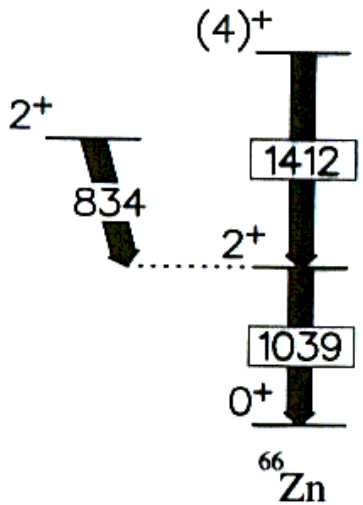
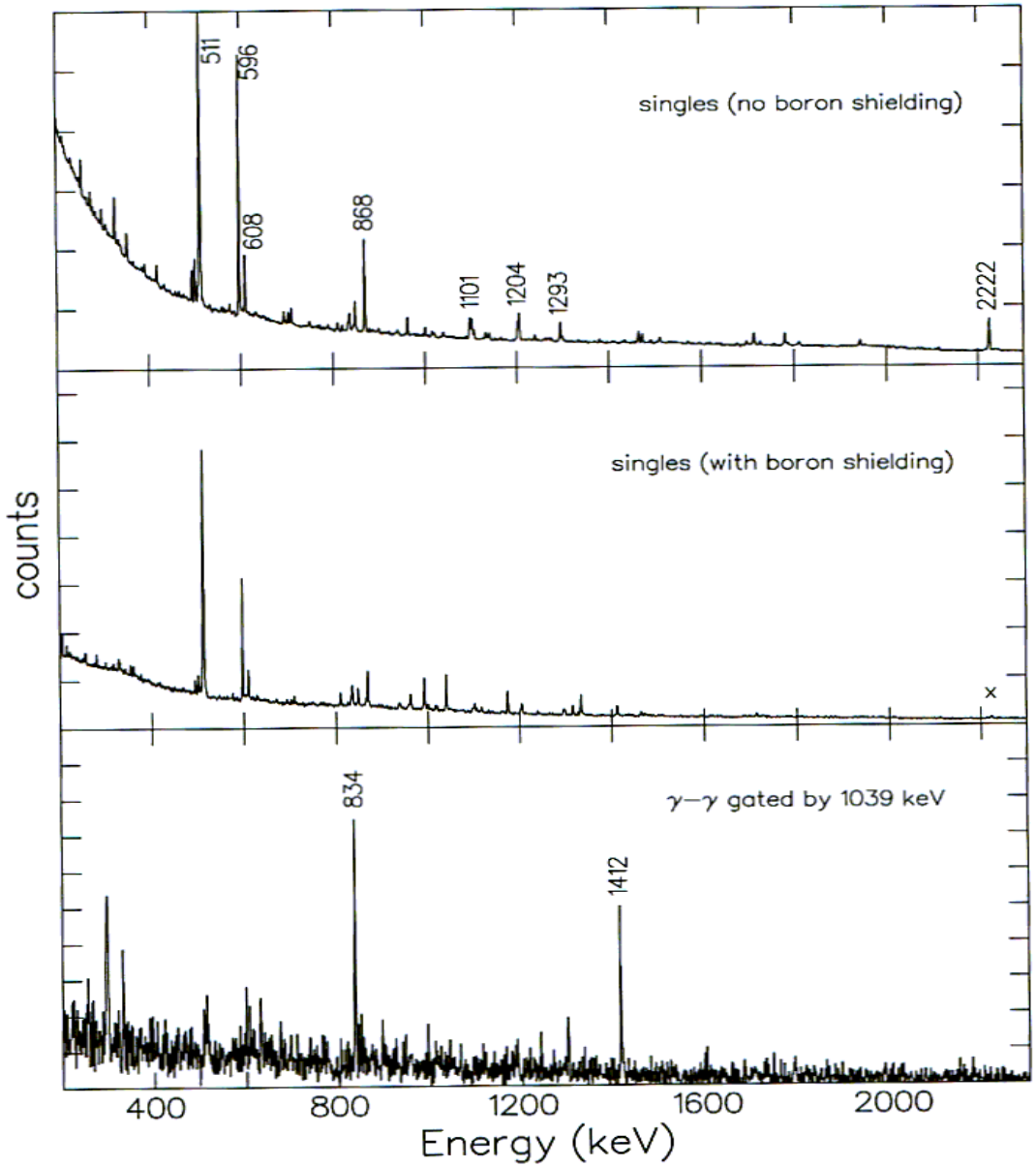
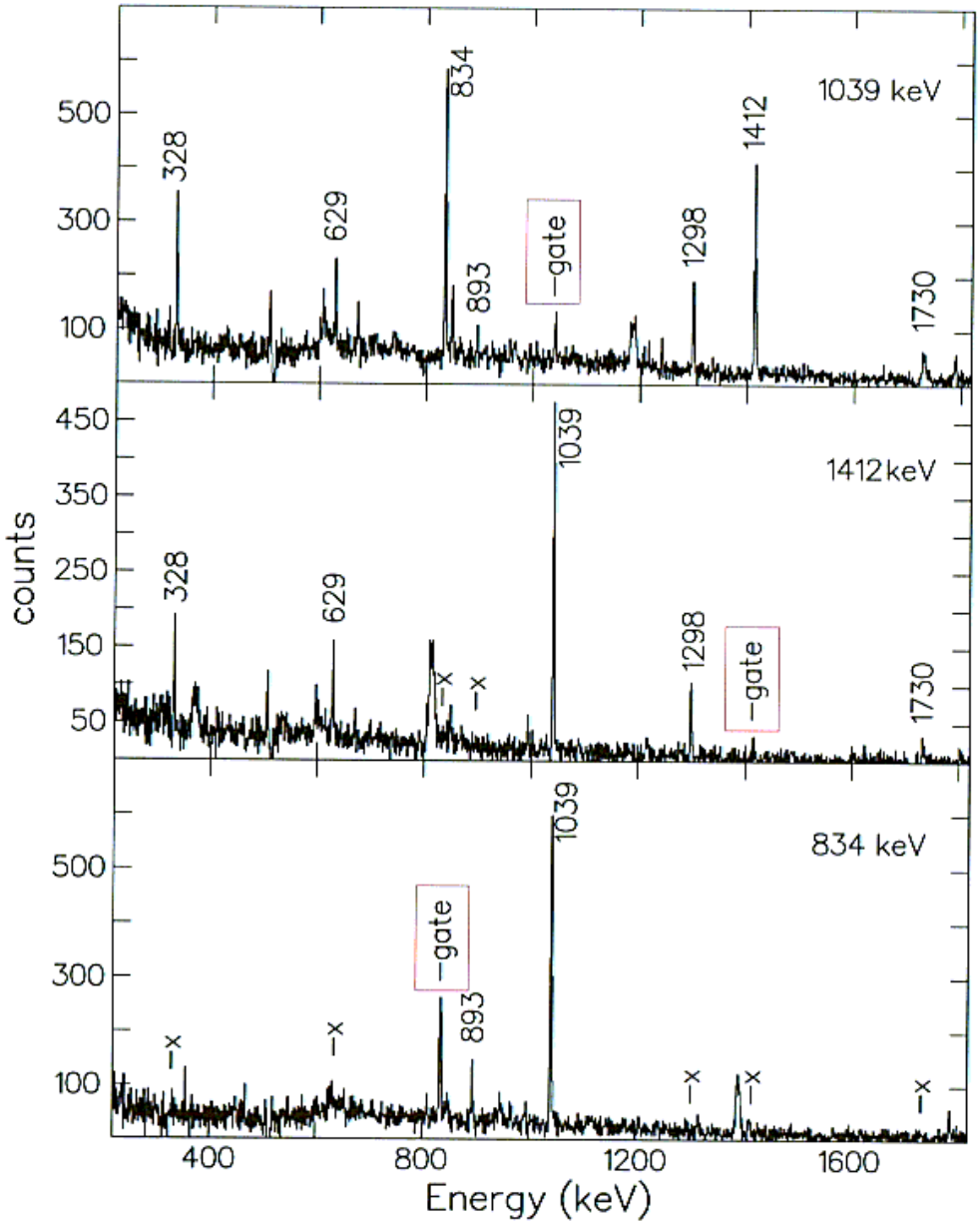


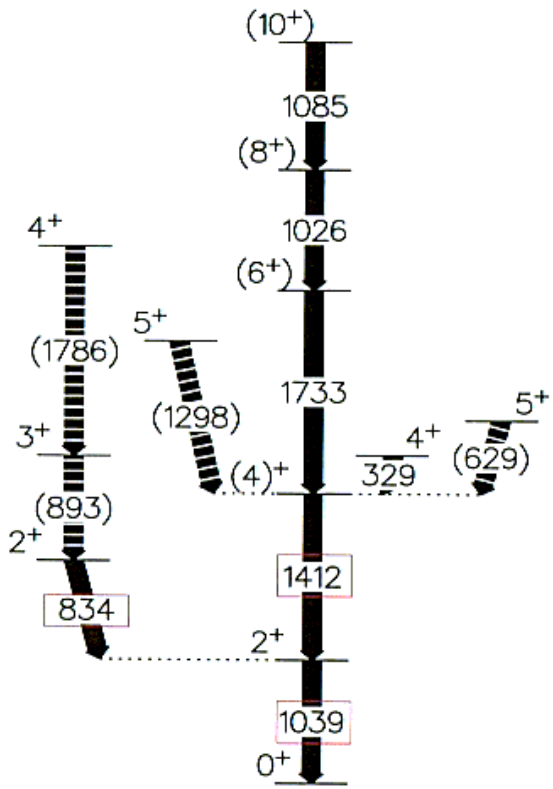



Counts
Energy (keV)
^{6}He on Cu
^{6}He on Al
511
596
608
702
834
847
868
961
1039 ^{66}Zn
1204
1412 ^{66}Zn
1400
1000
600
200
450
350
250
150
50
500
700
900
1100
1300


(4)$^+$
2$^+$
834
1412
2$^+$
1039
0$^+$
^{66}Zn


511
596
608
868
1101
1204
1293
2222
singles (no boron shielding)
singles (with boron shielding)
x
834
1412
γ−γ gated by 1039 keV
counts
400
800
1200
1600
2000
Energy (keV)





Dashed lines are tentatively new transitions

Acknowledgements

- A. Aprahamian, J. Kolata, V. Guimaraes, R. de Haan, L. Lamm, D. Peterson, P. Santi, A. Teymurazyan
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University of Michigan

- J. Brown
Milikan University

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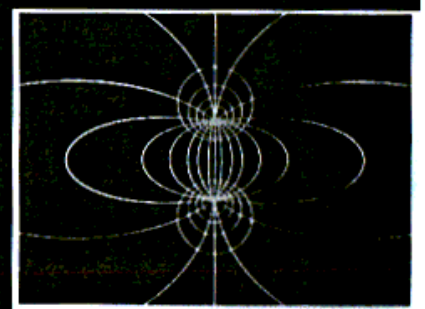

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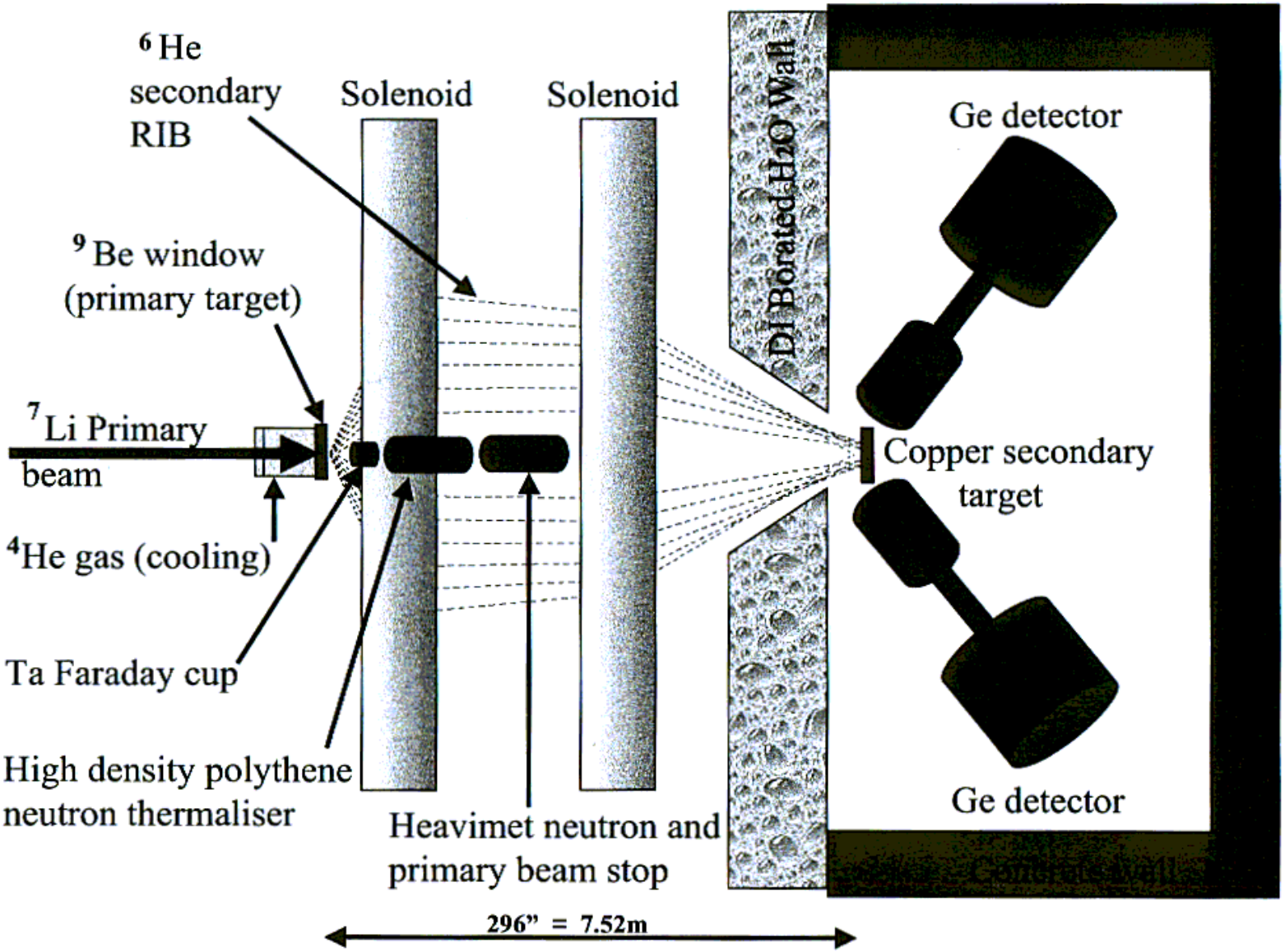
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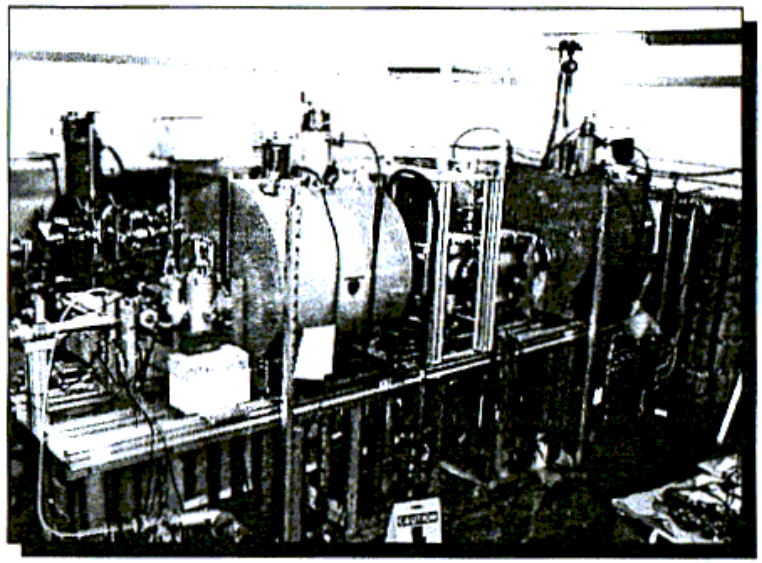

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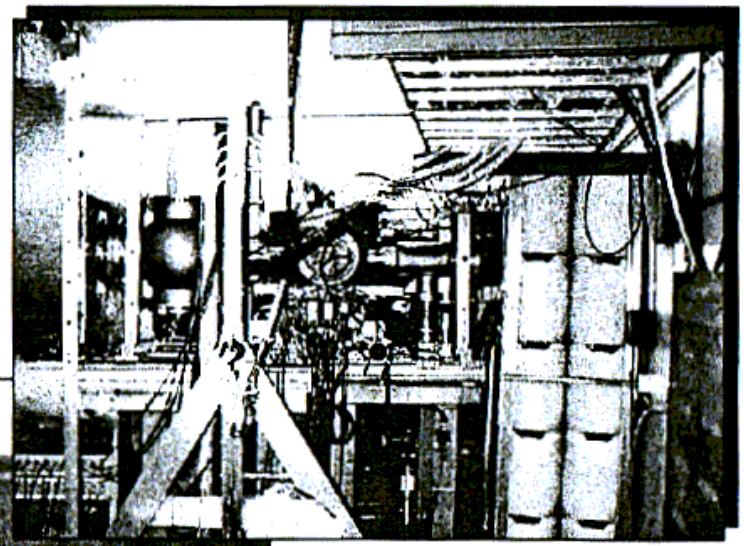

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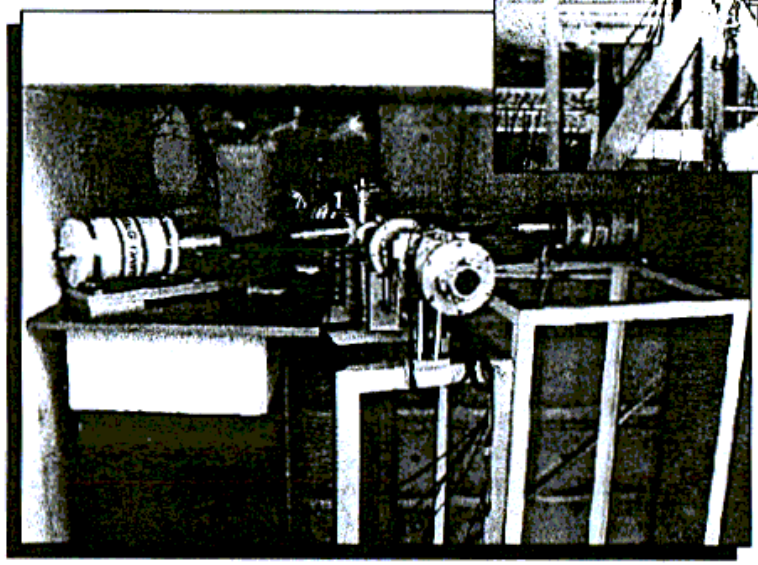

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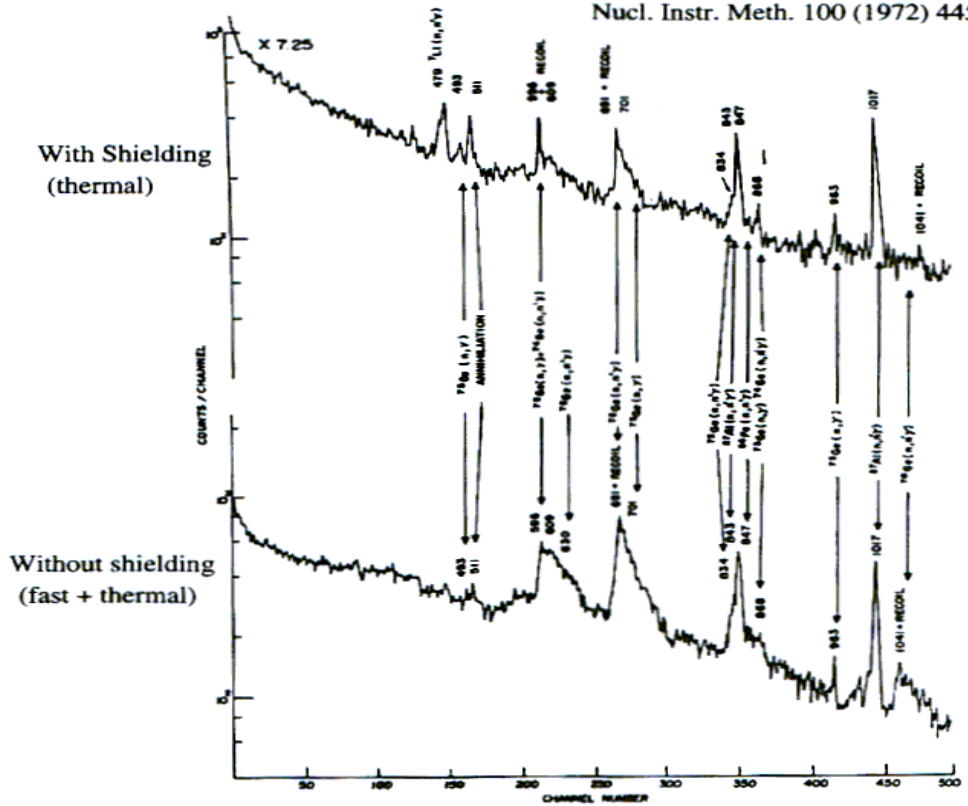

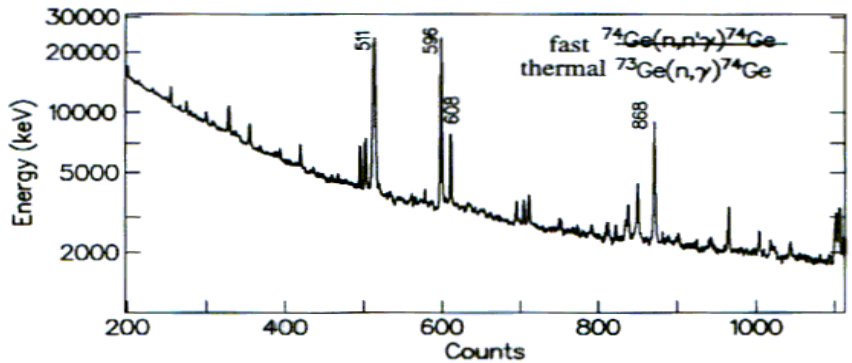

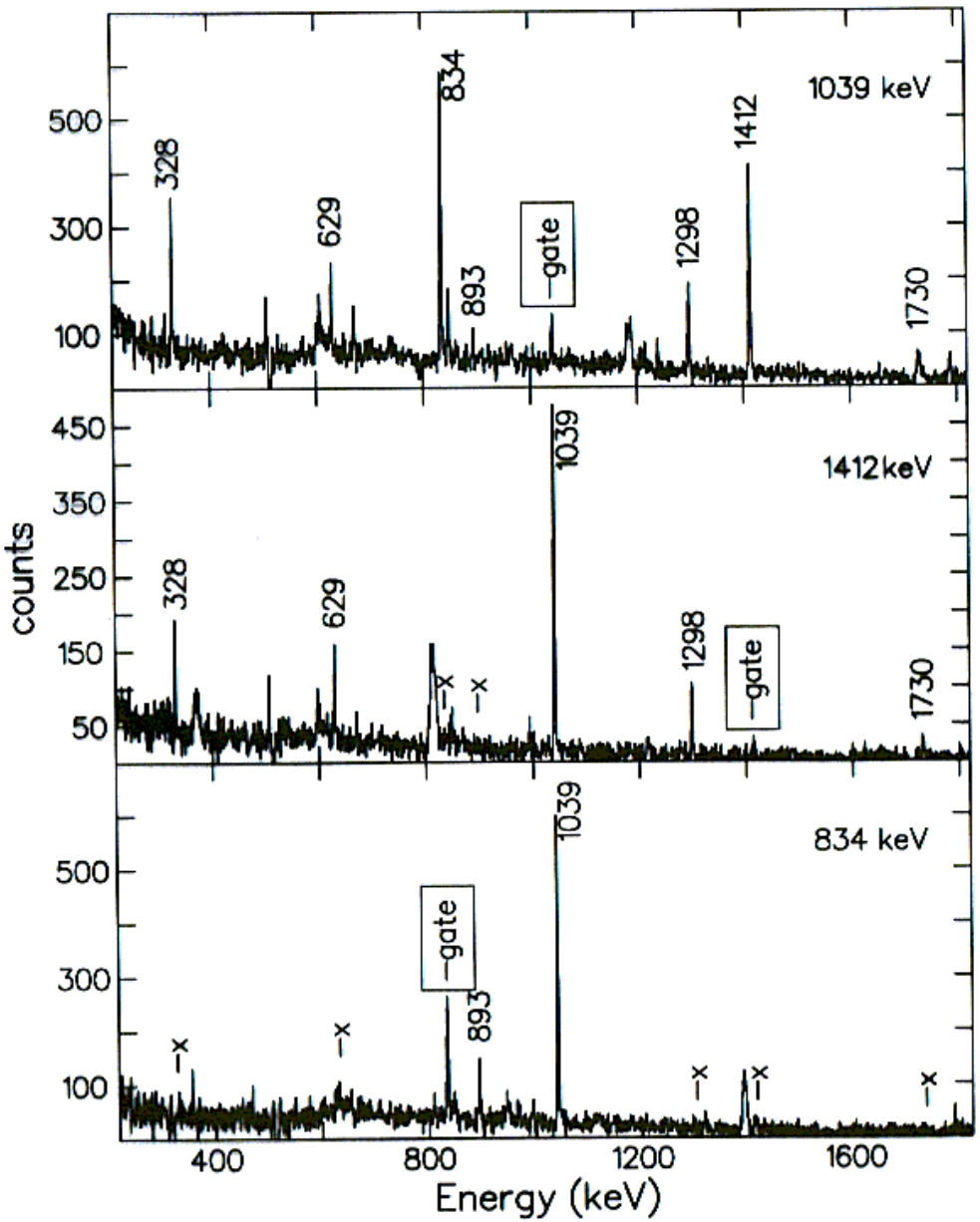

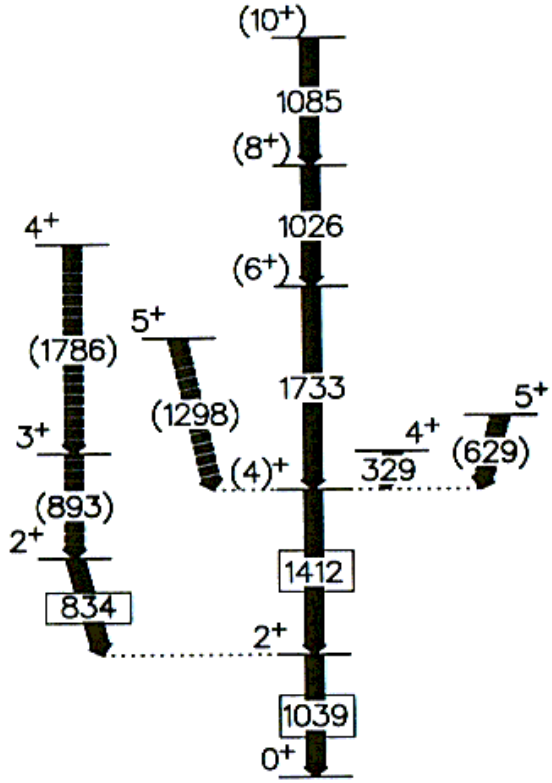

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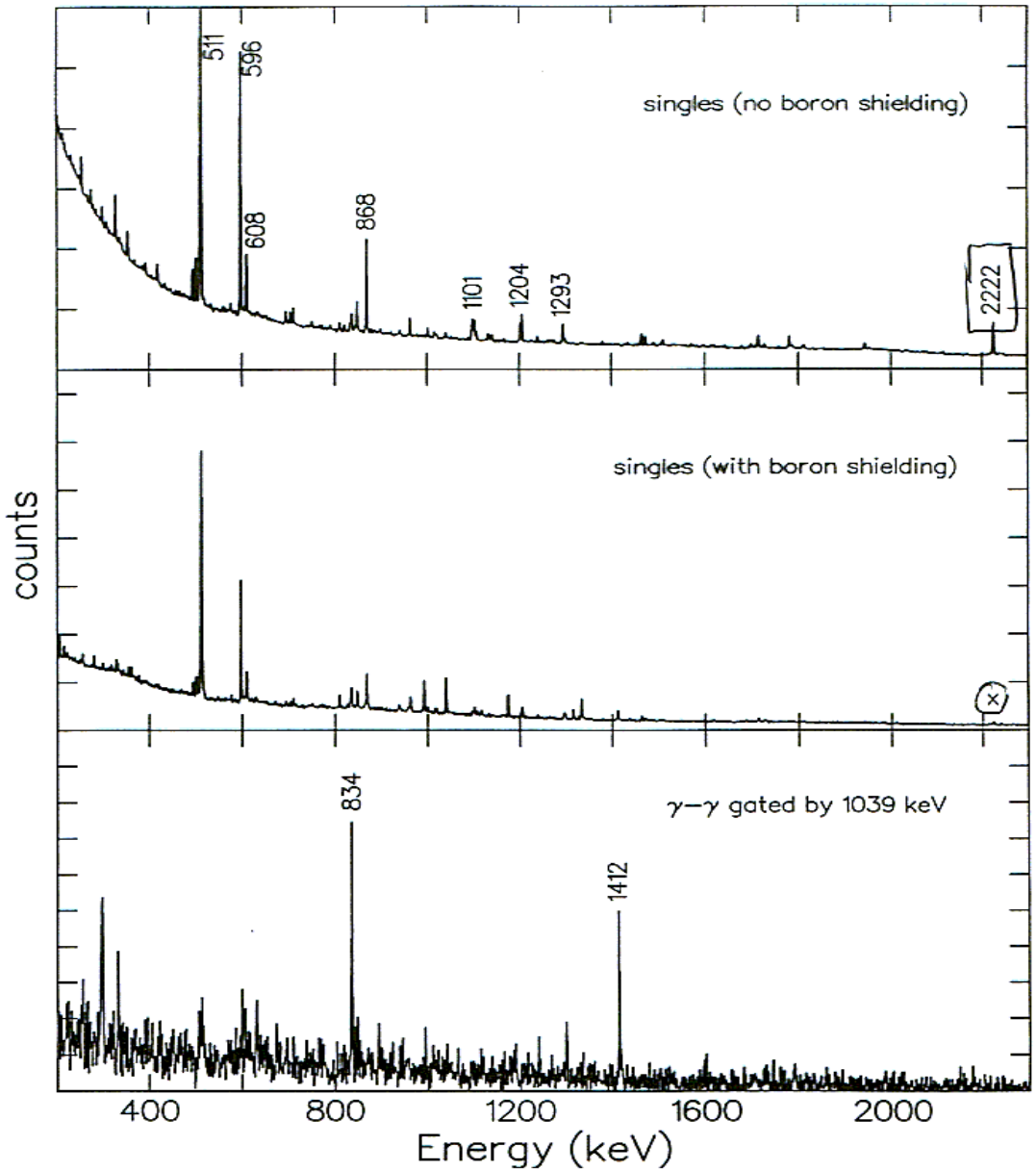
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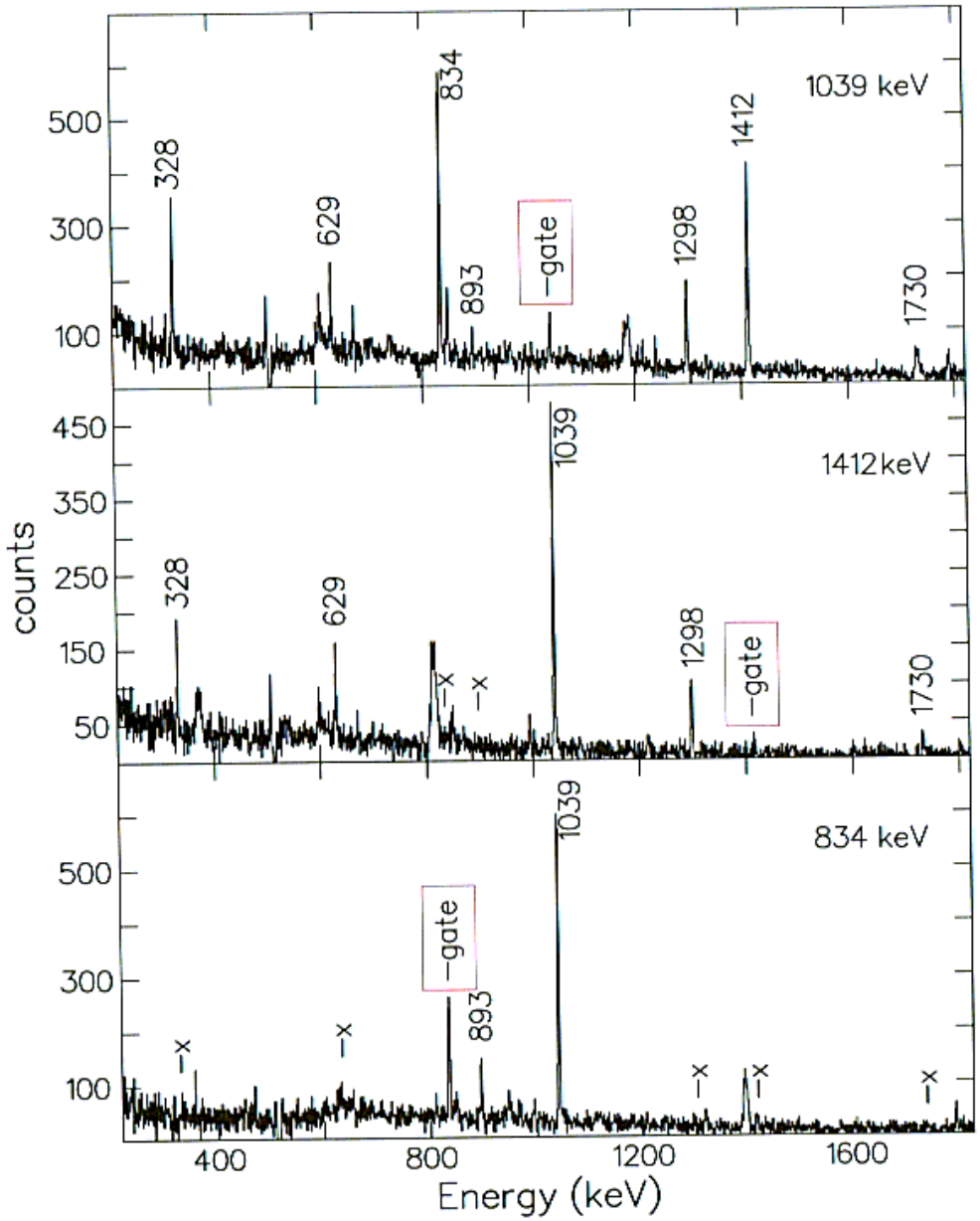

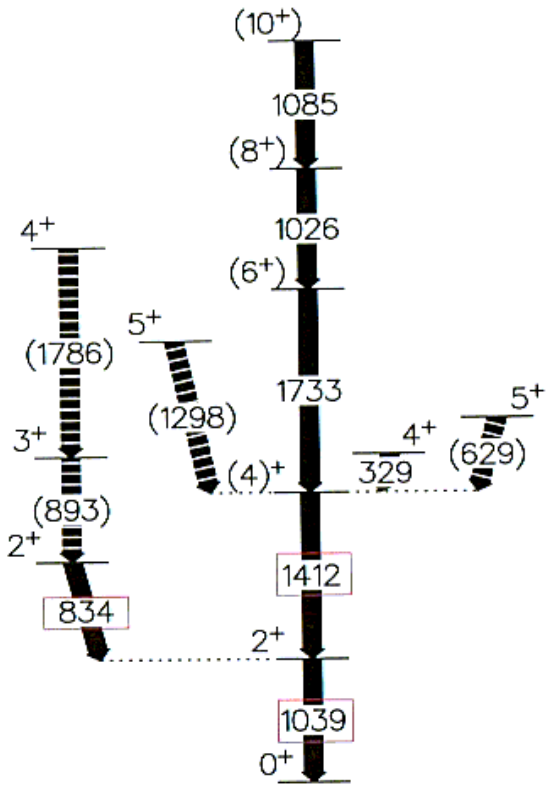

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