A Conceptual C/O Tool Design

X. Han and A. Shehata

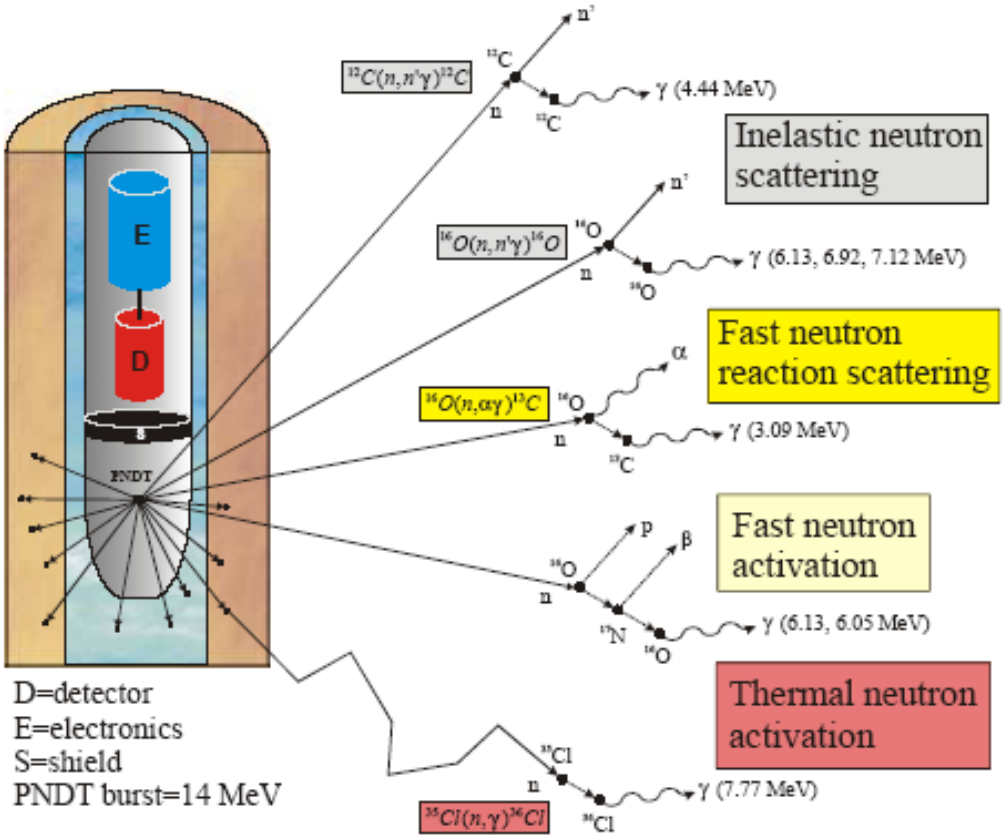
outline

- Overview
- MC Simulation
- Experiments
- Discussion and future work

hxiaoga@unity.ncsu.edu

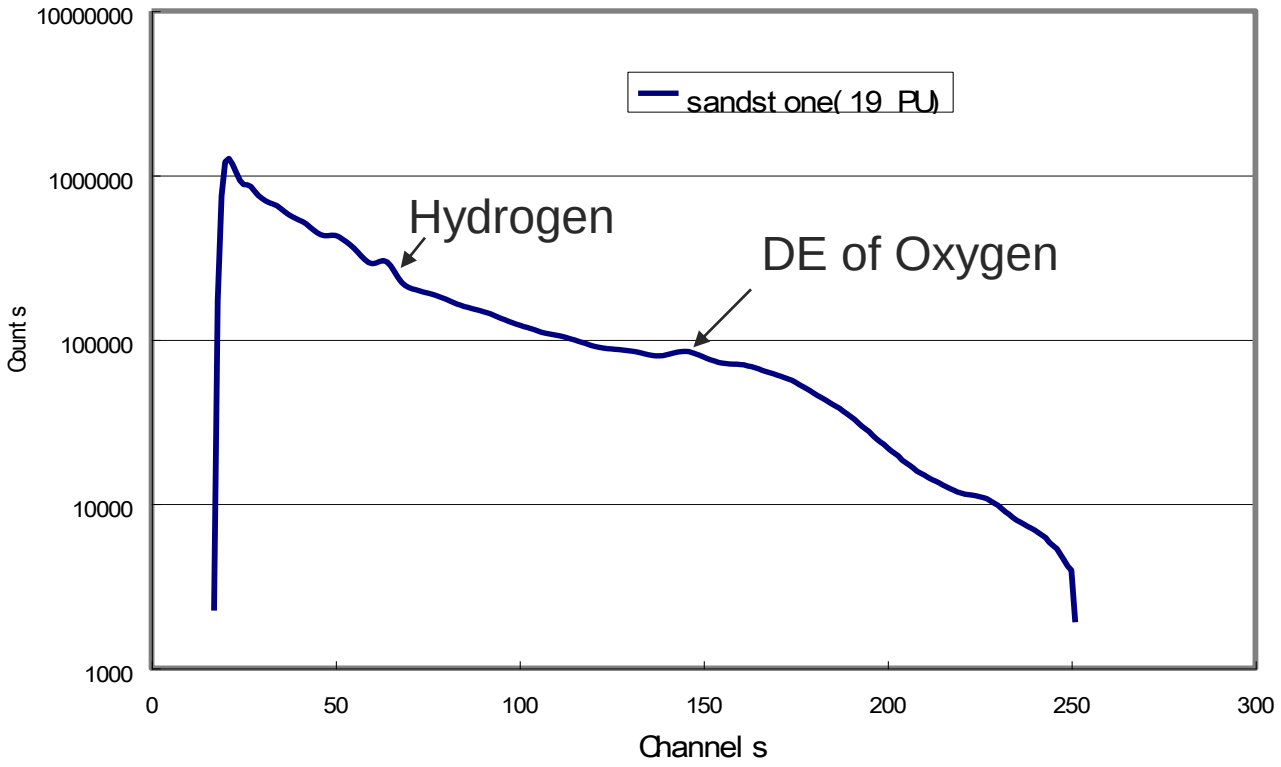
Overview

- Principle of classical C/O tool



Drawback

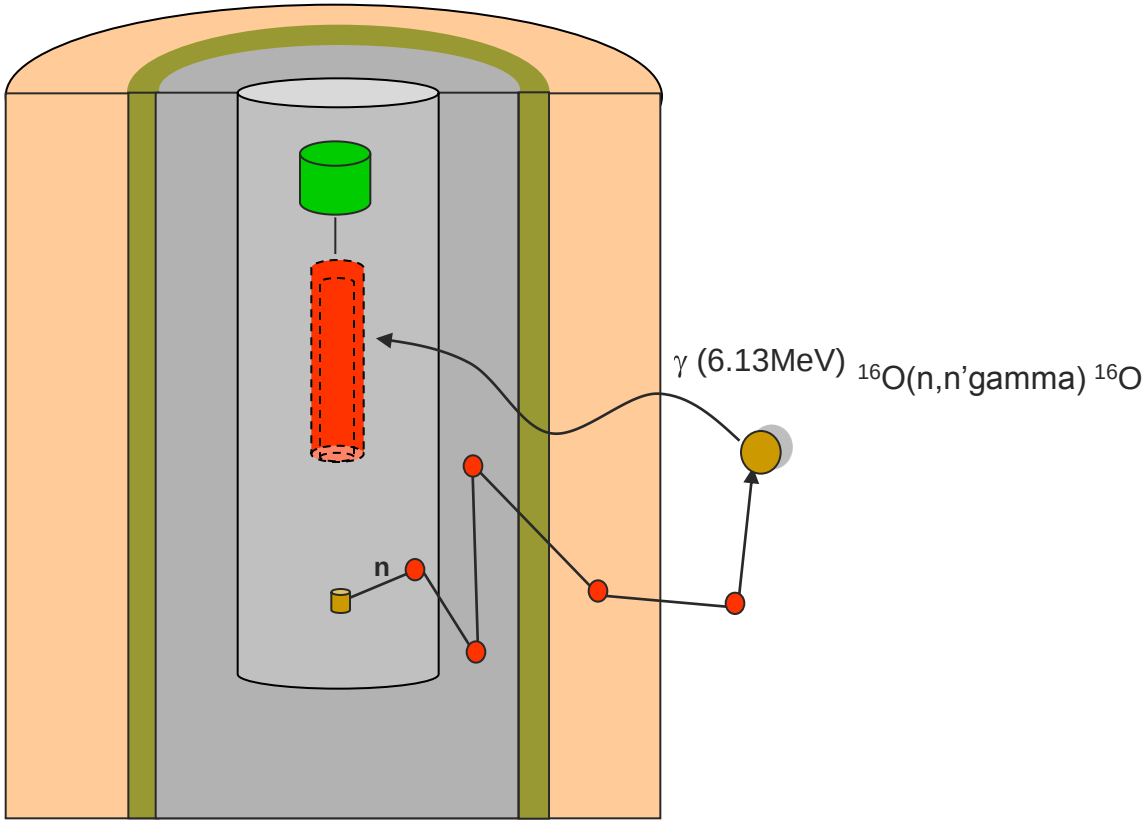
- Low efficiency
- Low signal – to – Noise Ratio



hxiaoga@unity.ncsu.edu

Overview

- Principle of New C/O tool



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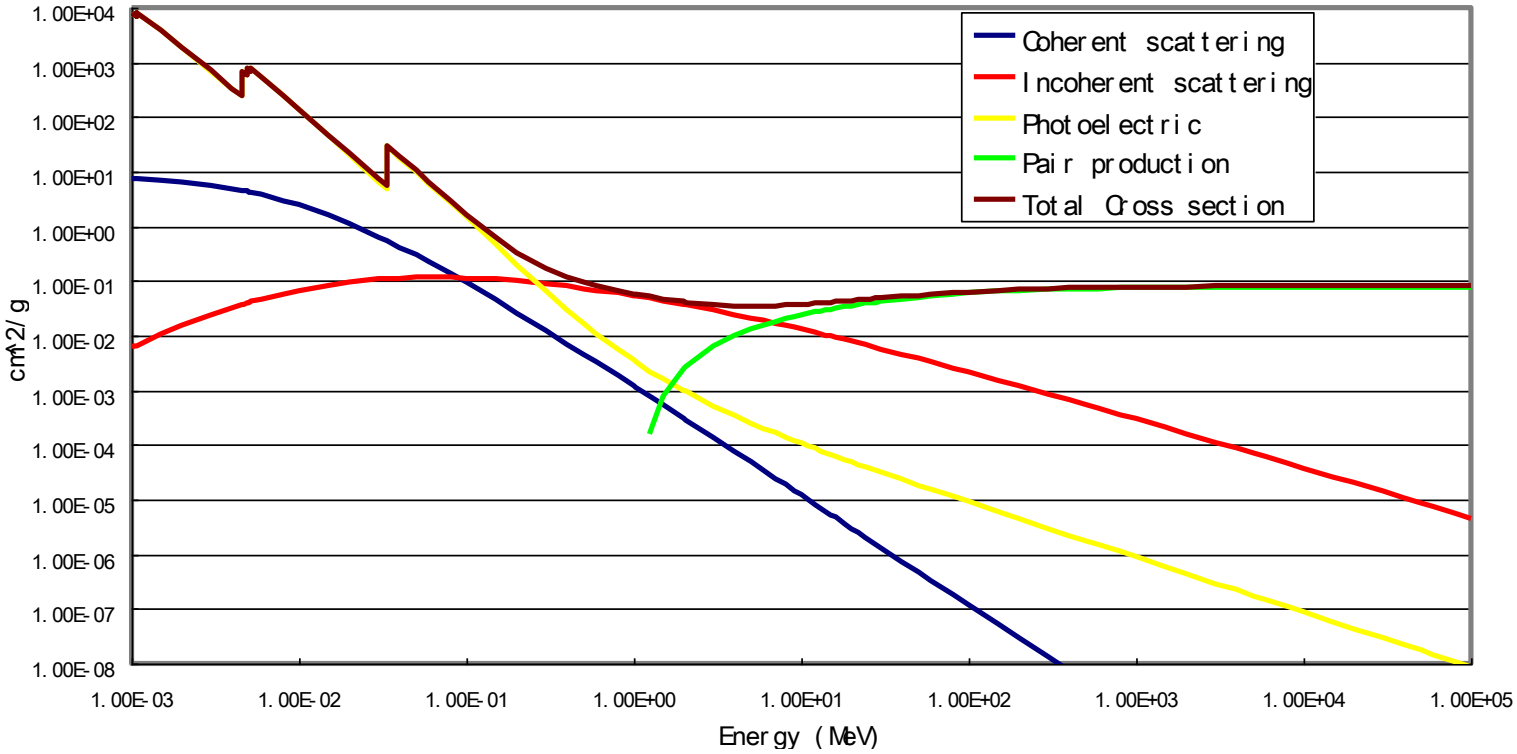

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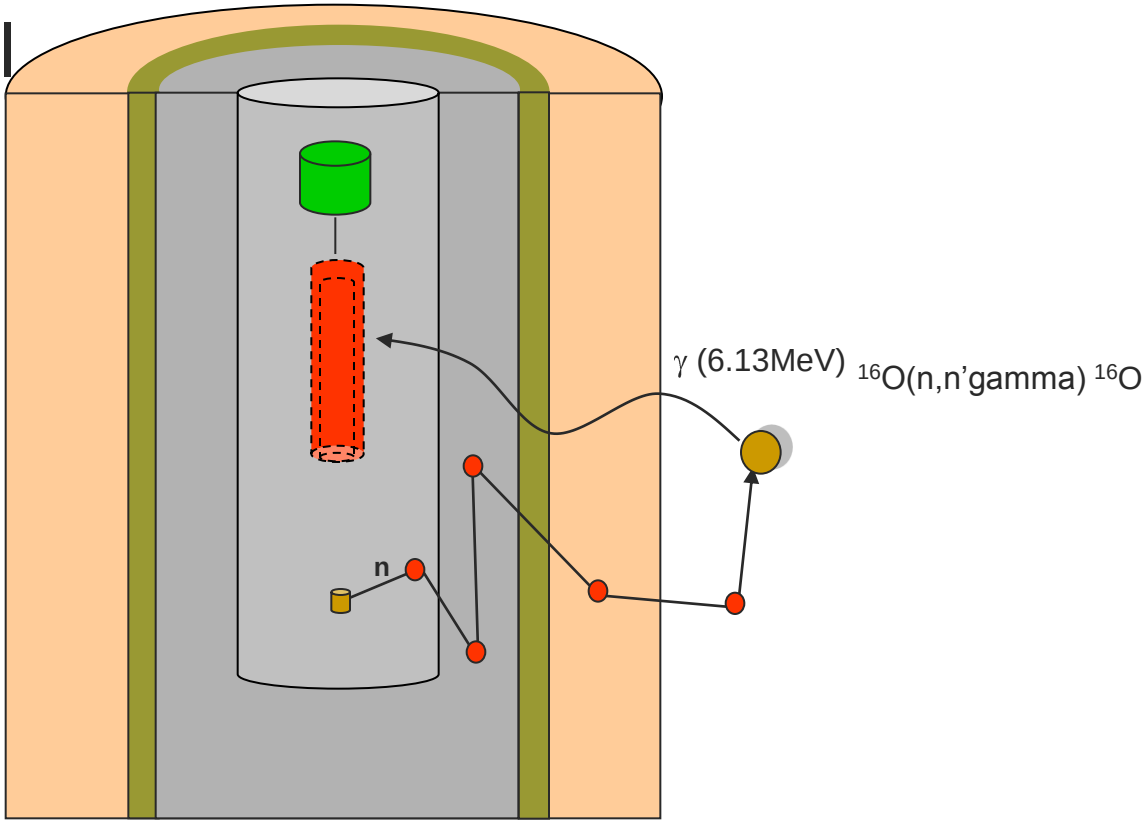
- Principle of New C/O tool



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Overview

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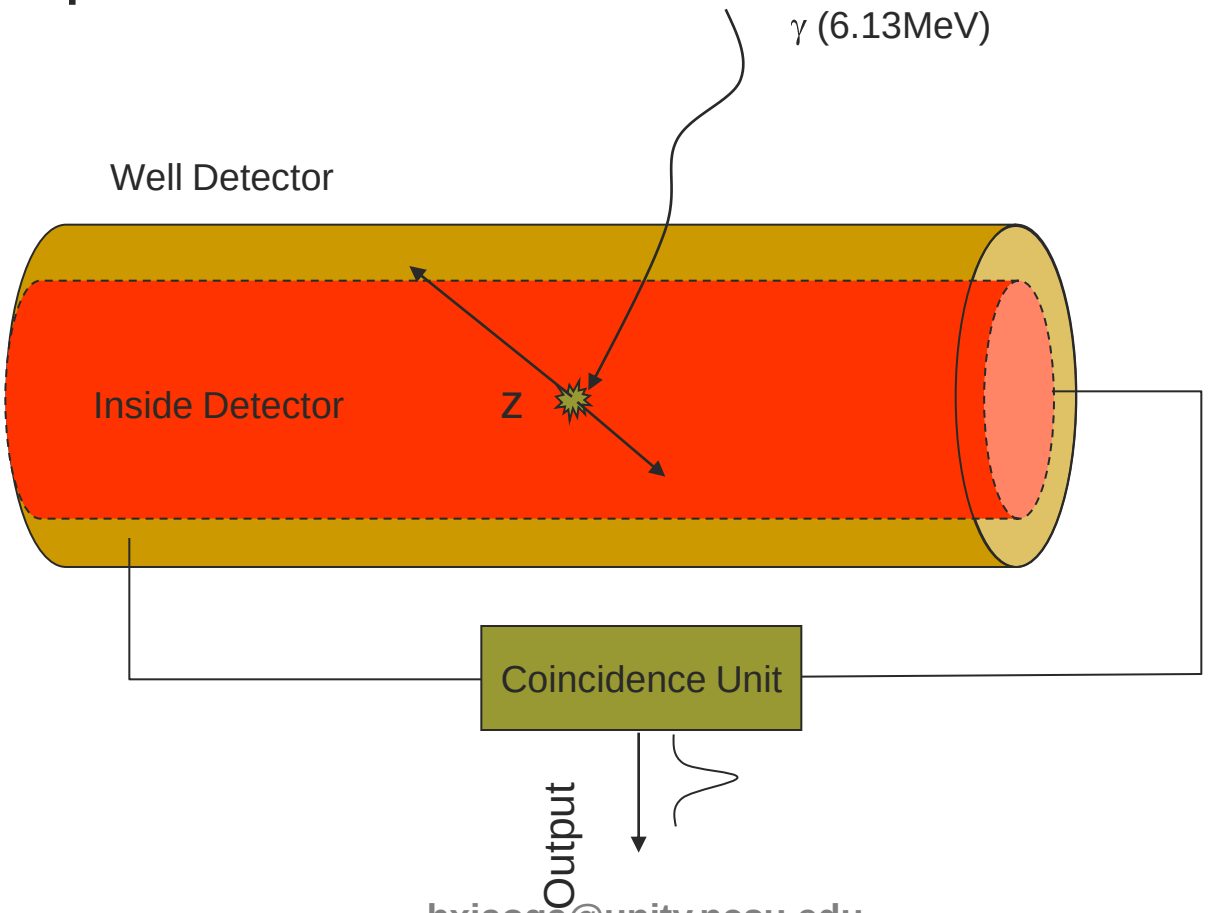

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Monte Carlo simulation

- Neutron transportation
- Neutron reaction (inelastic scattering, etc.)
- Gamma rays generating process
- Gamma rays transportation

Can be used to

- Calculate Coincidence spectra
- Optimize geometry detector arrangement

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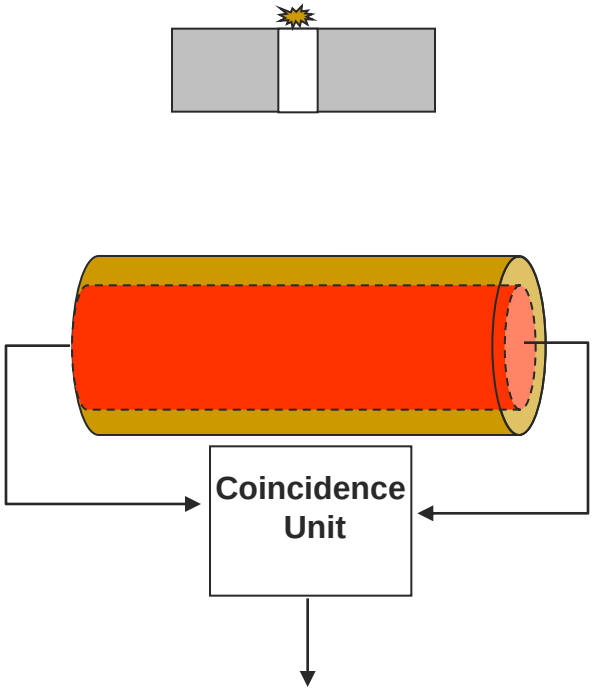
Experiment treatment

- Two detector arrangement
  - NaI (Well typed detector: 4.4 cmX14.4 cm, Thickness = 0.6393 cm; Inside detector: 2.54 cm X 13.97 cm)
  - BGO (well typed detector: 9.5cm X 15.2 cm, thickness = 2.2 cm; inside detector: 4.5 cm X 15.8 cm)
- ^{24}Na (1.368 MeV 2.754 MeV)

hxiaoga@unity.ncsu.edu

- Experiment setup



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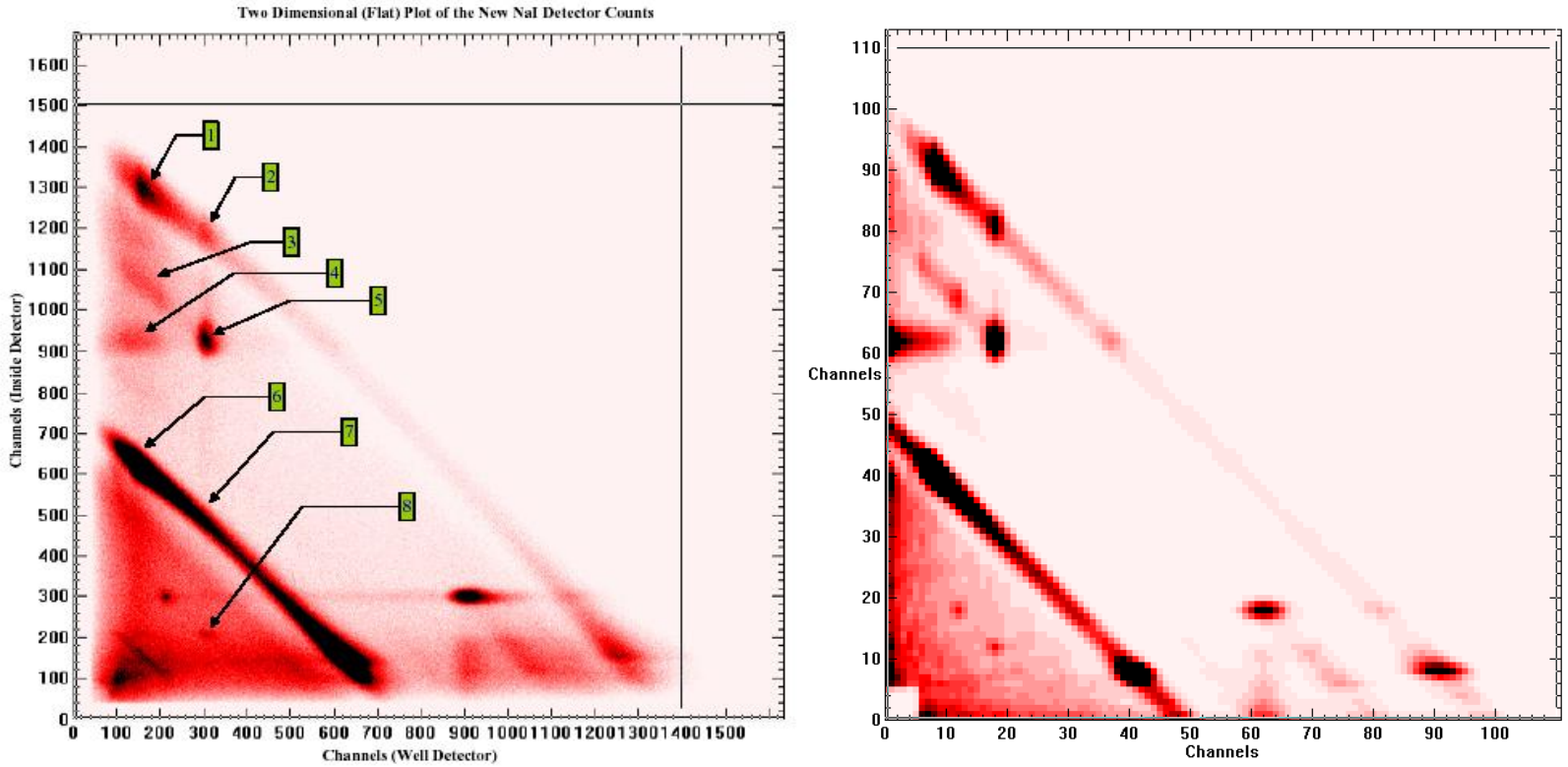
- NaI detector arrangement



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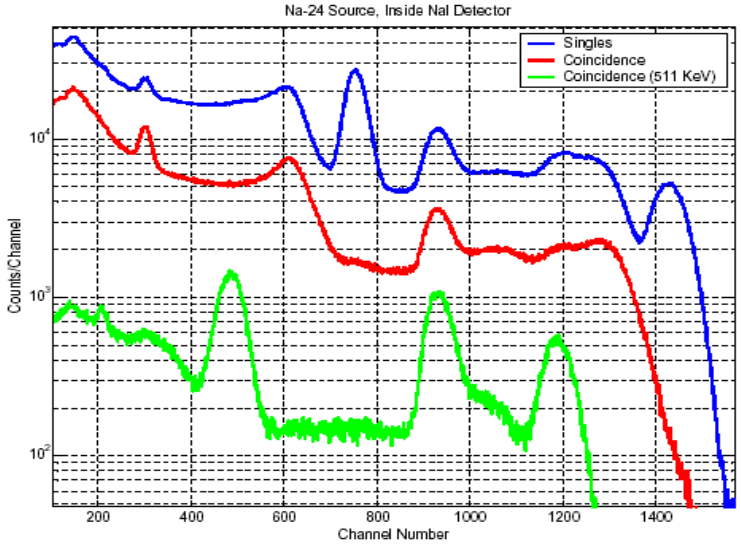

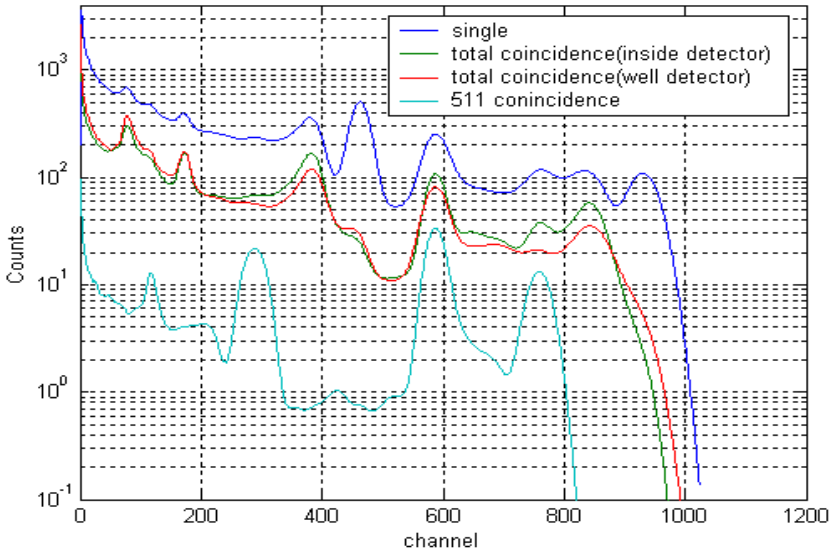

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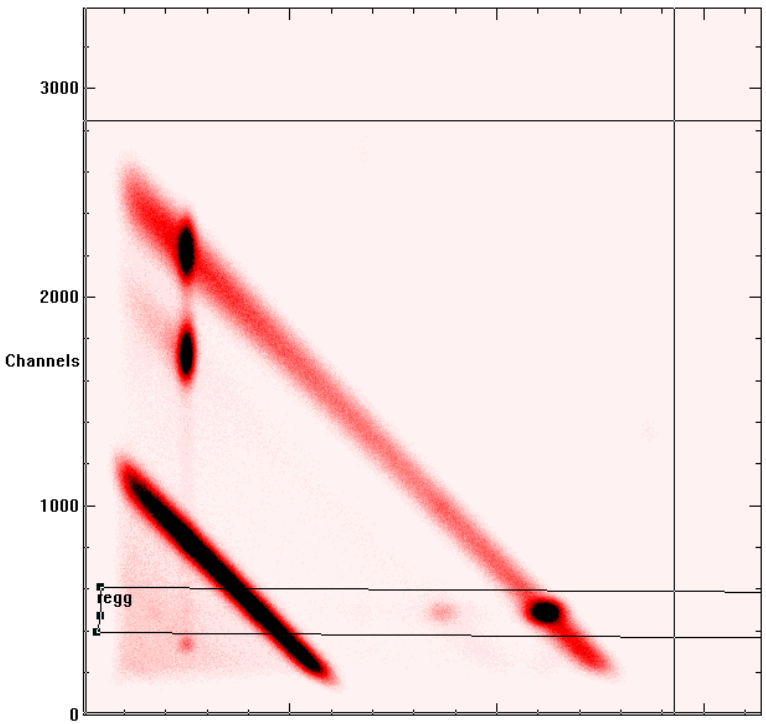

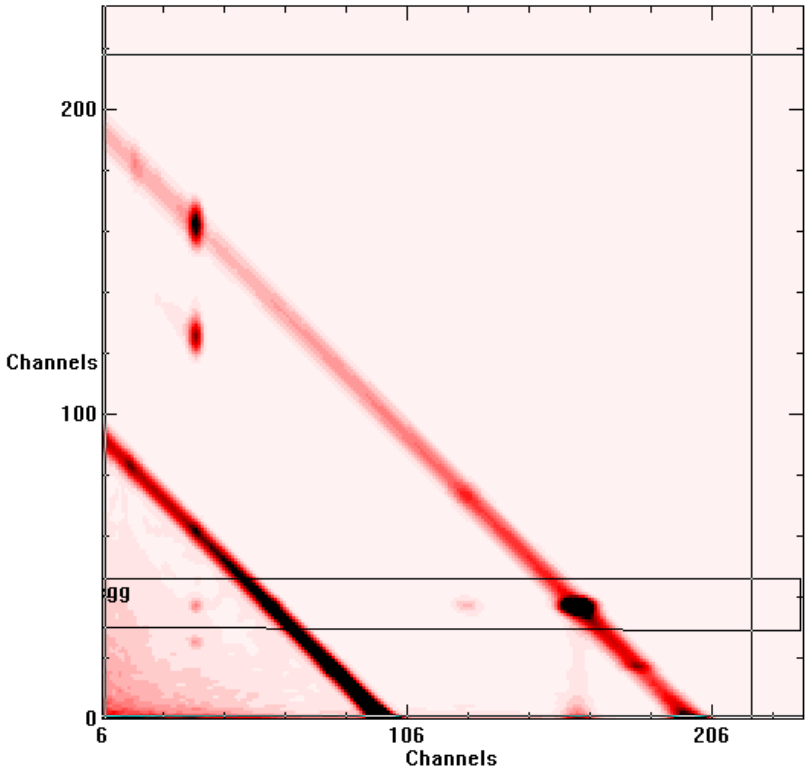

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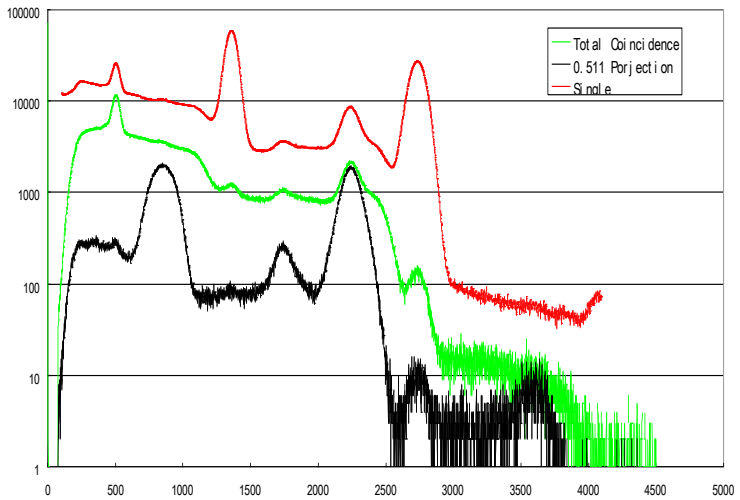

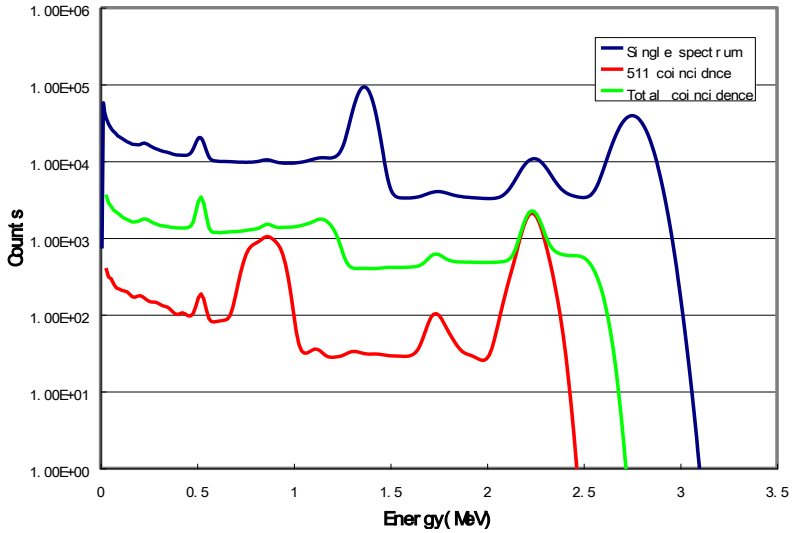

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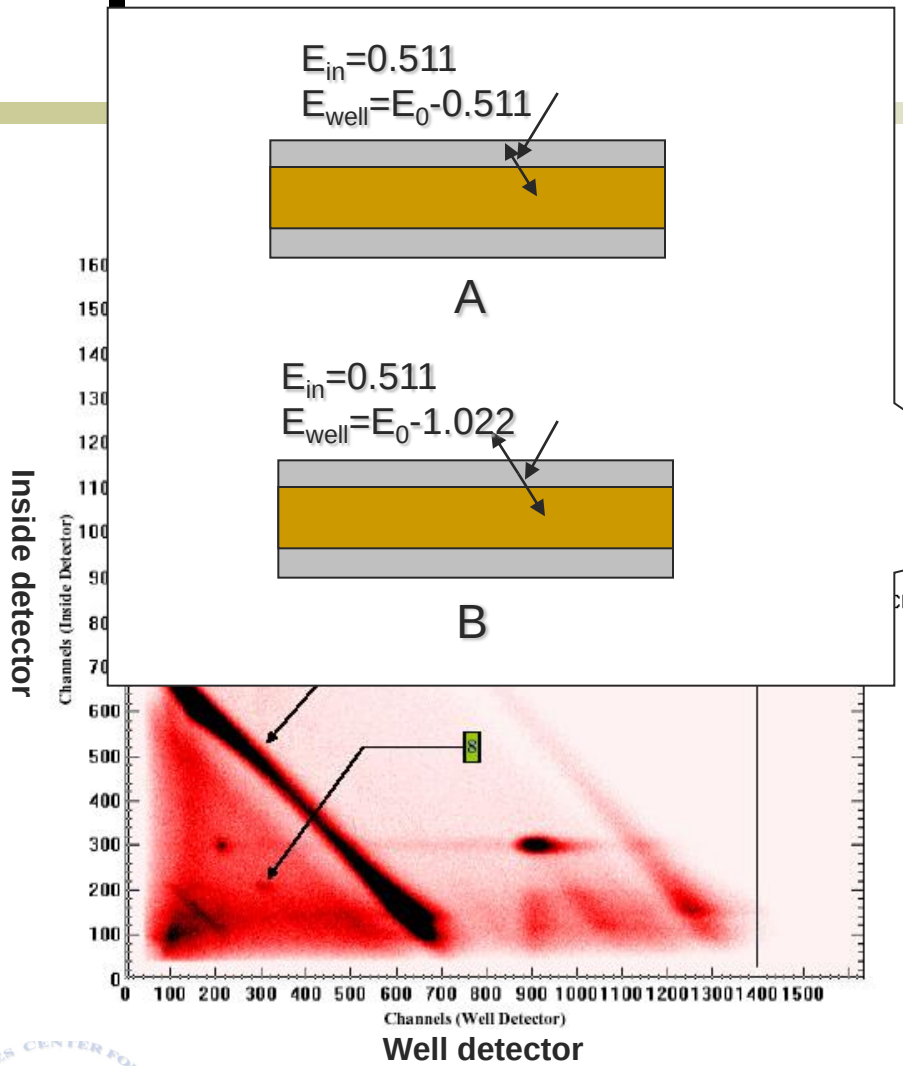
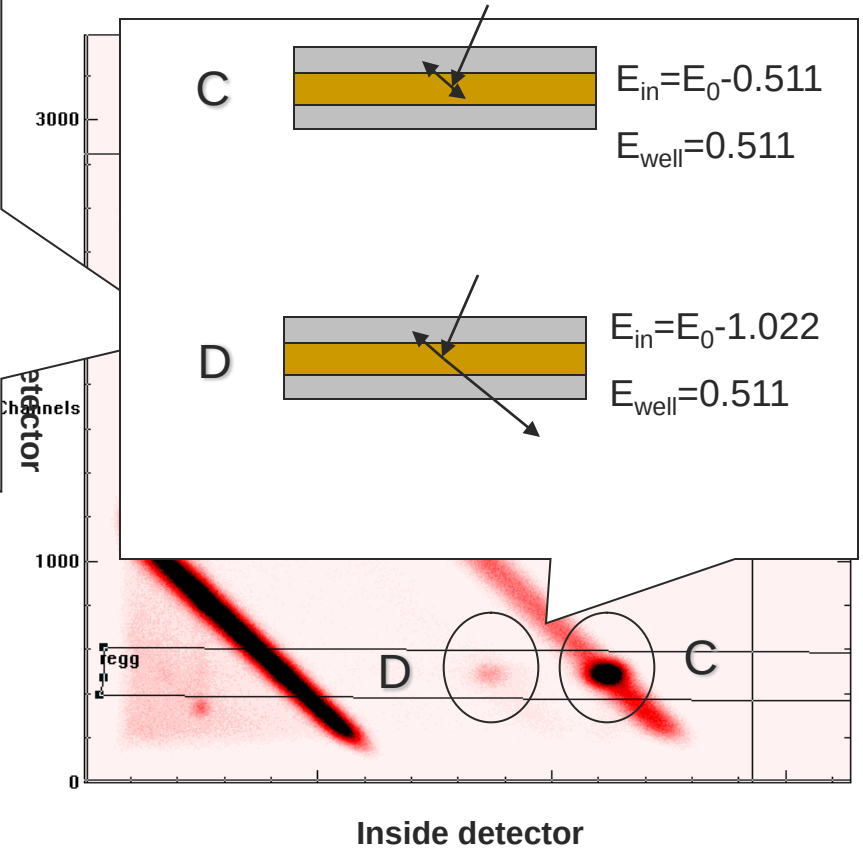
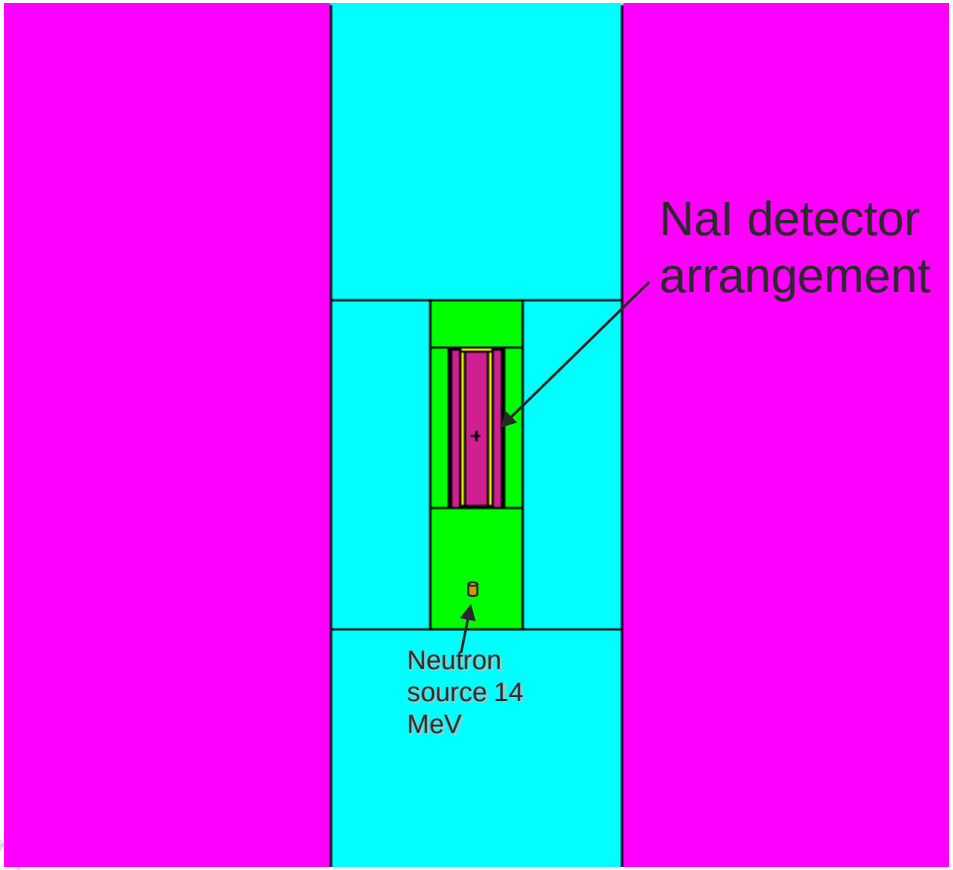


NaI Detector arrangement



BGO Detector arrangement

hxiaoga@unity.ncsu.edu



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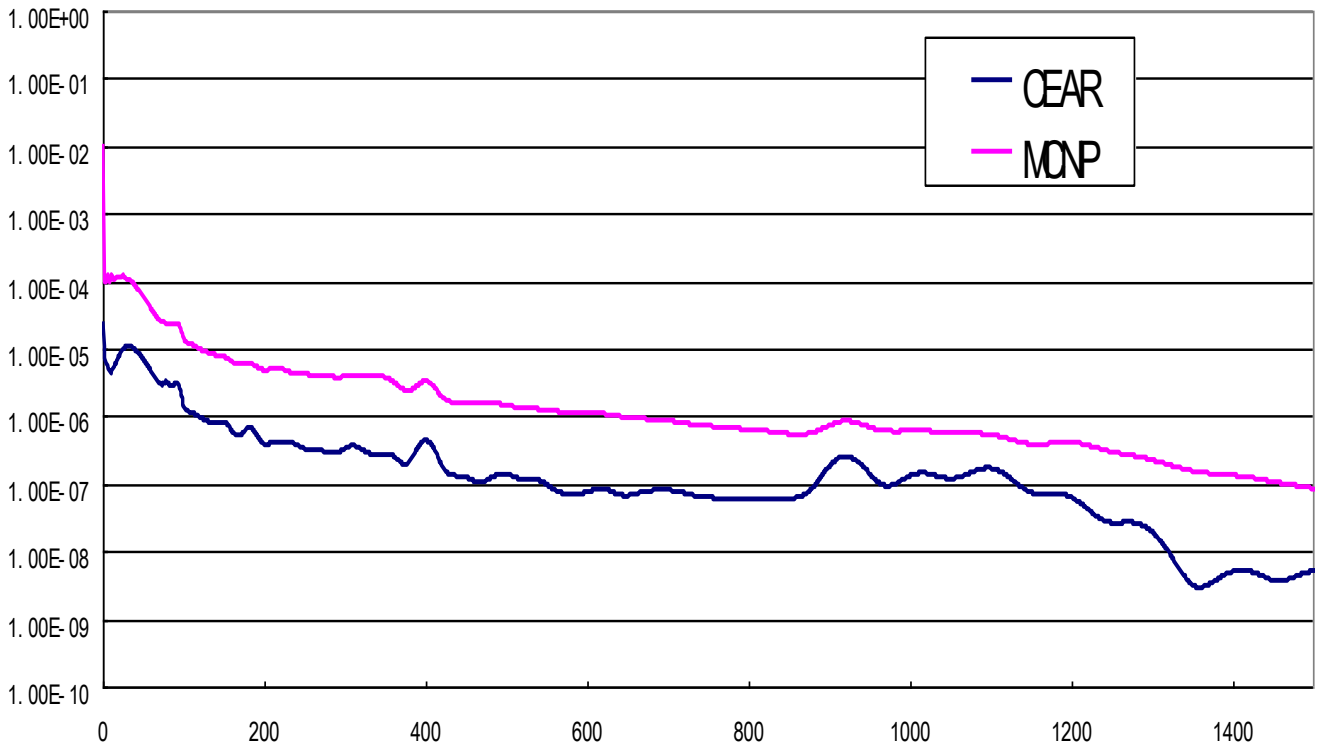
Single spectra



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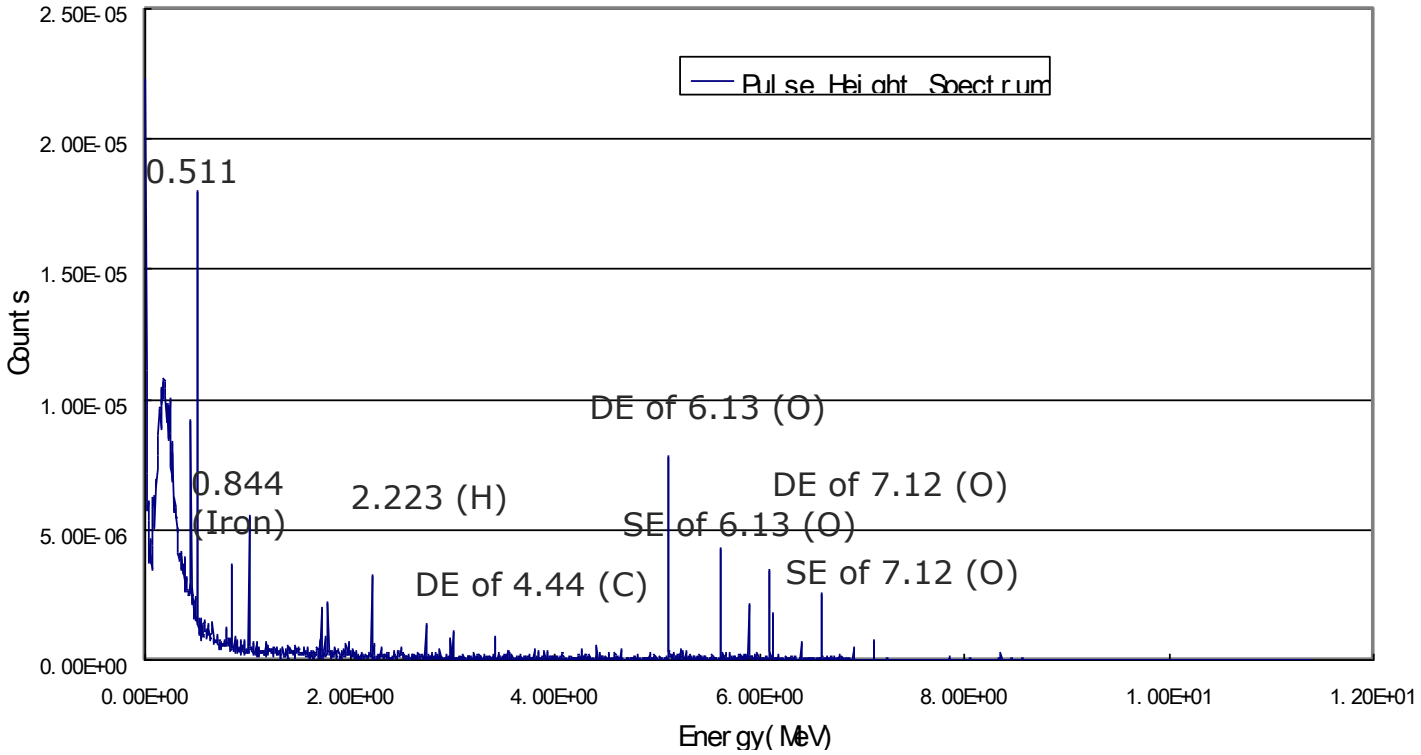

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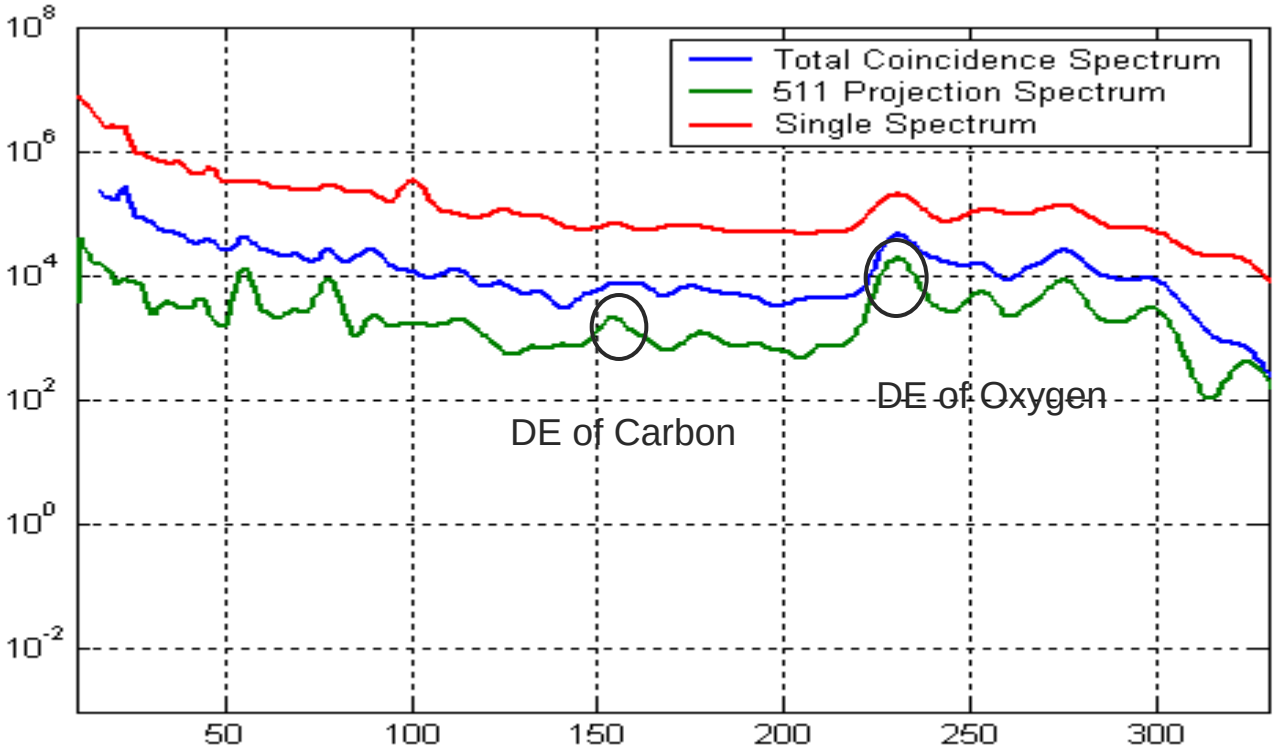

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Future work

- Optimization of BGO detector arrangement
- Measure the STD of Photoelectron peak for BGO detector

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END

Thank you