Developing detectors at the University of Surrey

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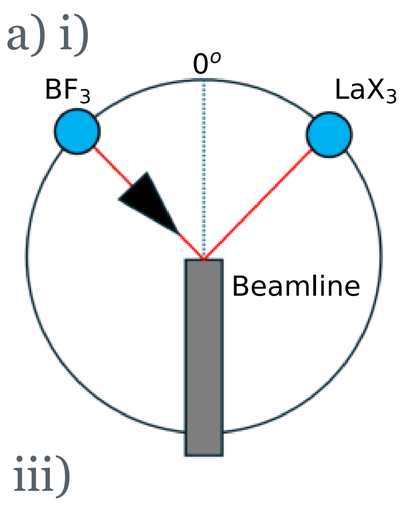
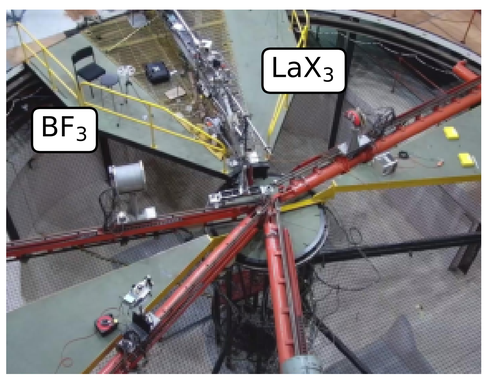
*NTR-Net pilot project

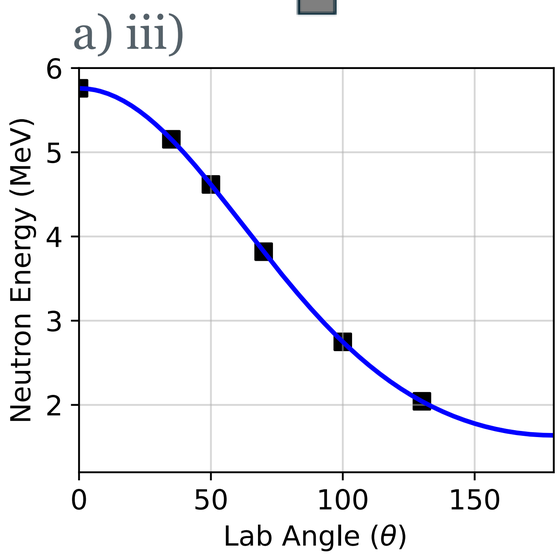
Introduction

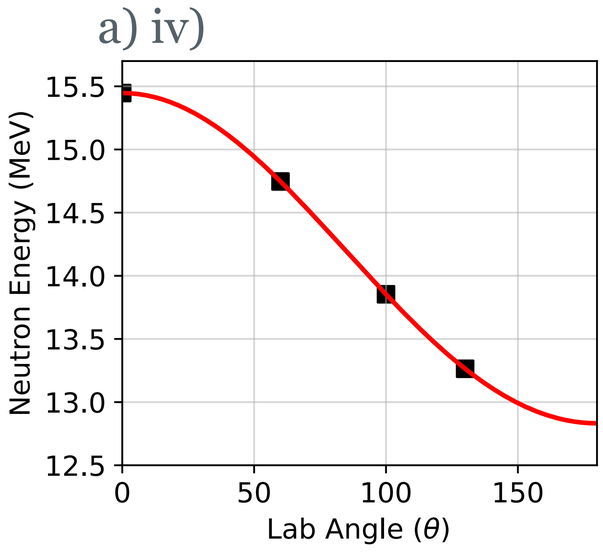
At the University of Surrey, we have worked to develop a number of novel applications of existing scintillator detectors
Combining previously poorly explored neutron responses (e.g. Ref. [1]) and novel configurations (e.g. Ref. [2])

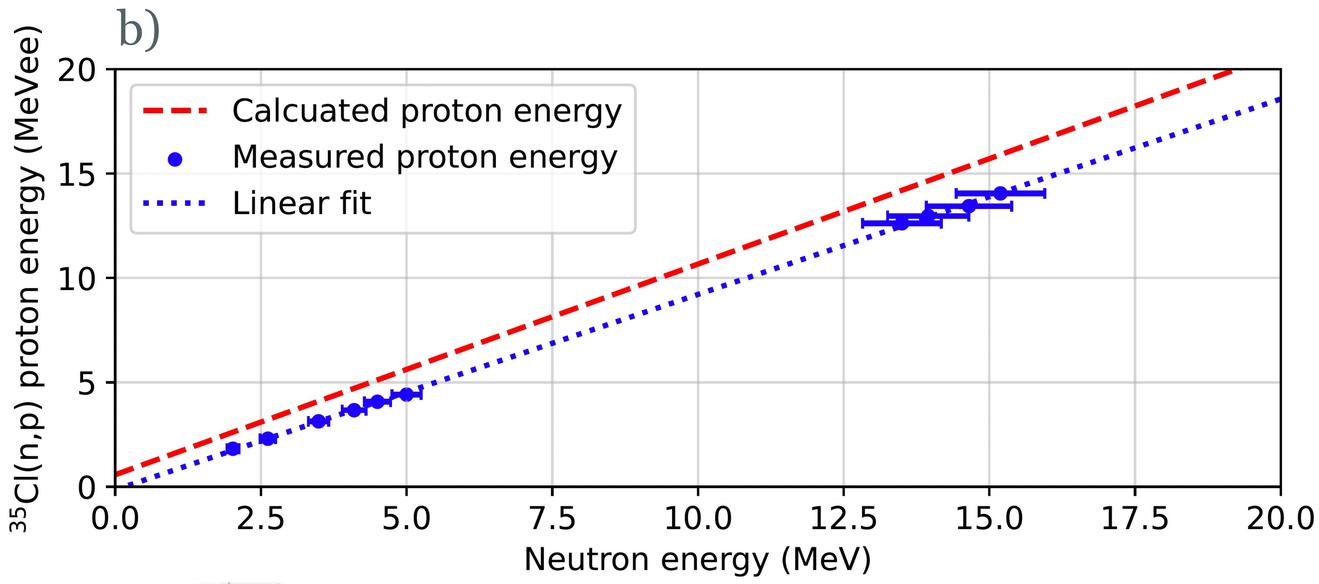
Lanthanum halides as neutron thermometers

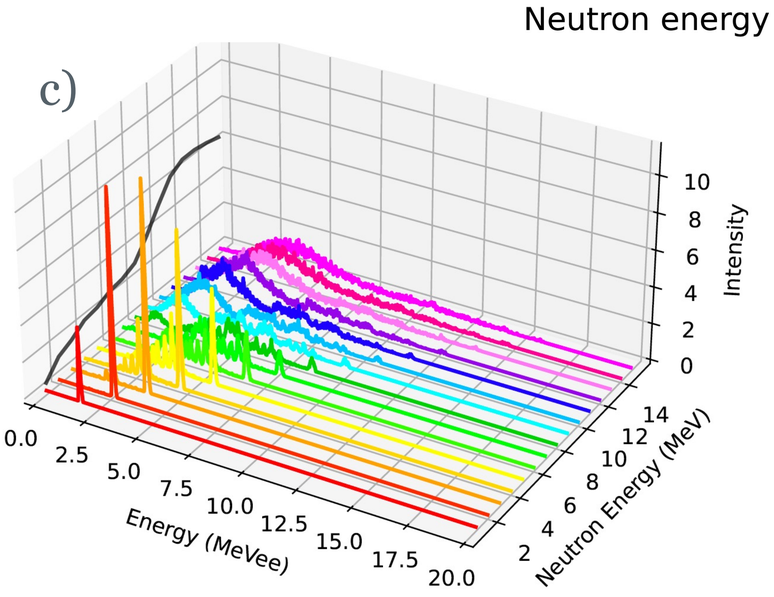












a) Experimental setup at NPL

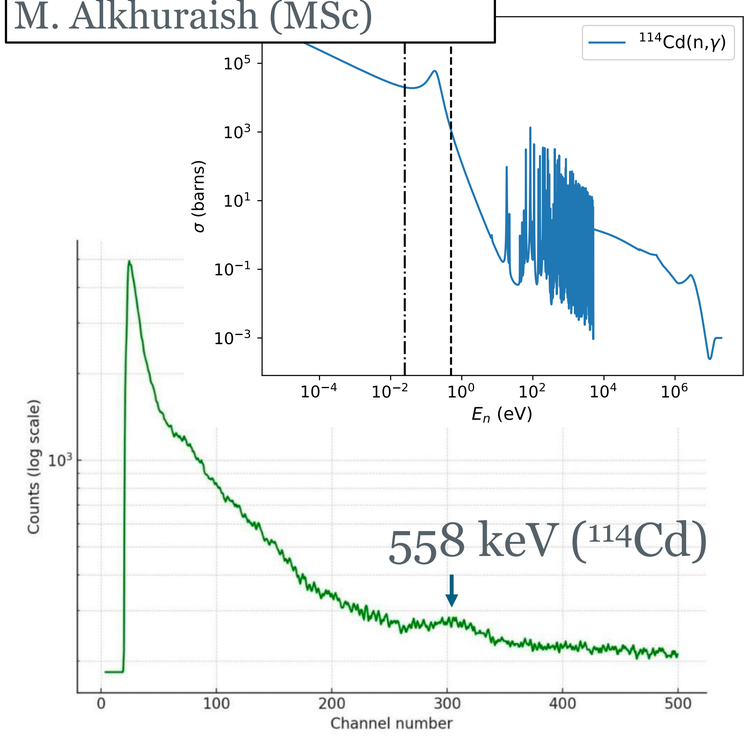
b) Linearity of proton response

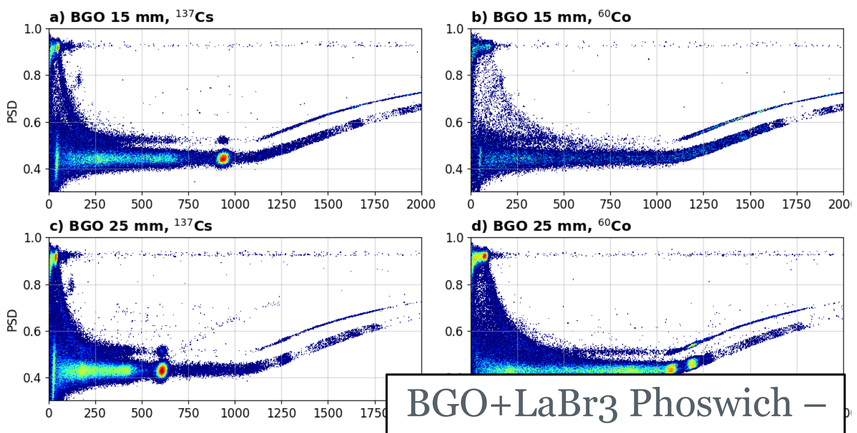
c) Simulated ^{35}Cl(n,p) spectra

Other detector work

Variety of detectors tested, many with help of students

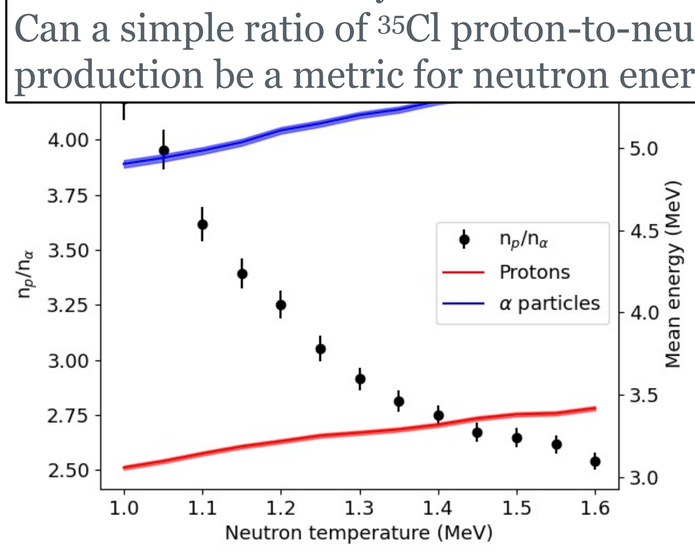
$CdWO_4$ thermal neutrons– M. Alkhuraish (MSc)

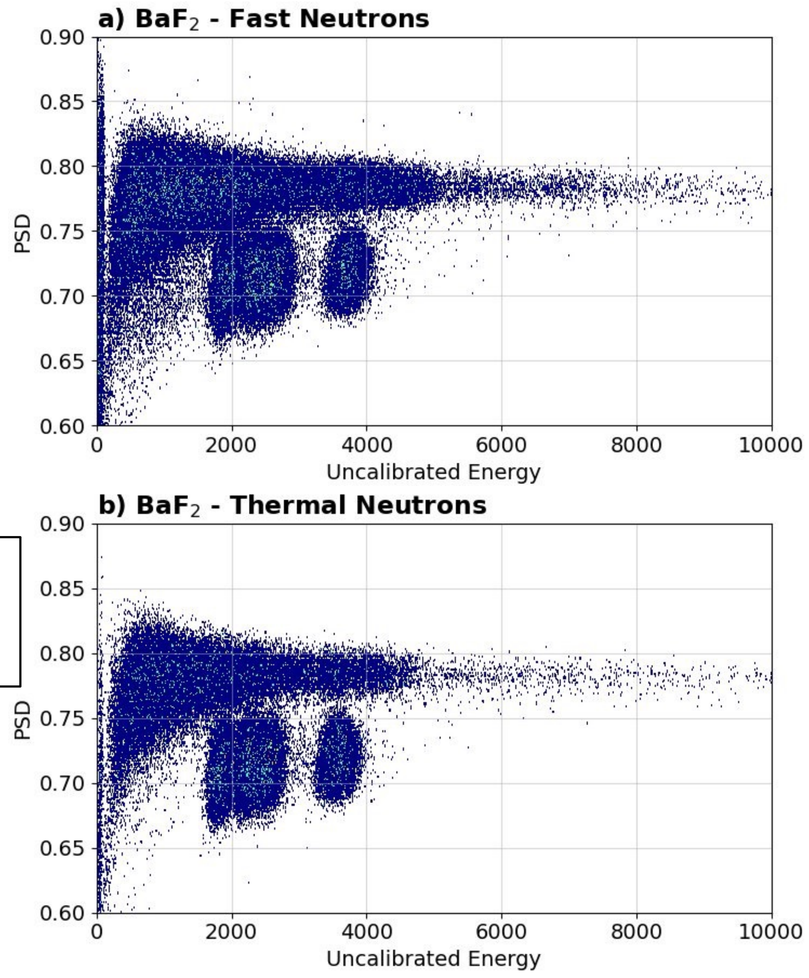




BGO+LaBr3 Phoswich – J. Coutts (NTR-Net Pilot)

Neutron thermometry:
Can a simple ratio of ^{35}Cl proton-to-neutron production be a metric for neutron energy?





BaF_2 for fast neutrons
J. O'Neill, J. Coutts & M. Alkhuraish

Acknowledgements
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References

[1] M.P. Taggart and J. Henderson, NIM A **975** 164201 (2020)
[2] J. Maslin, J. Henderson and M. P. Taggart, NIM A **1058** 168898 (2024)