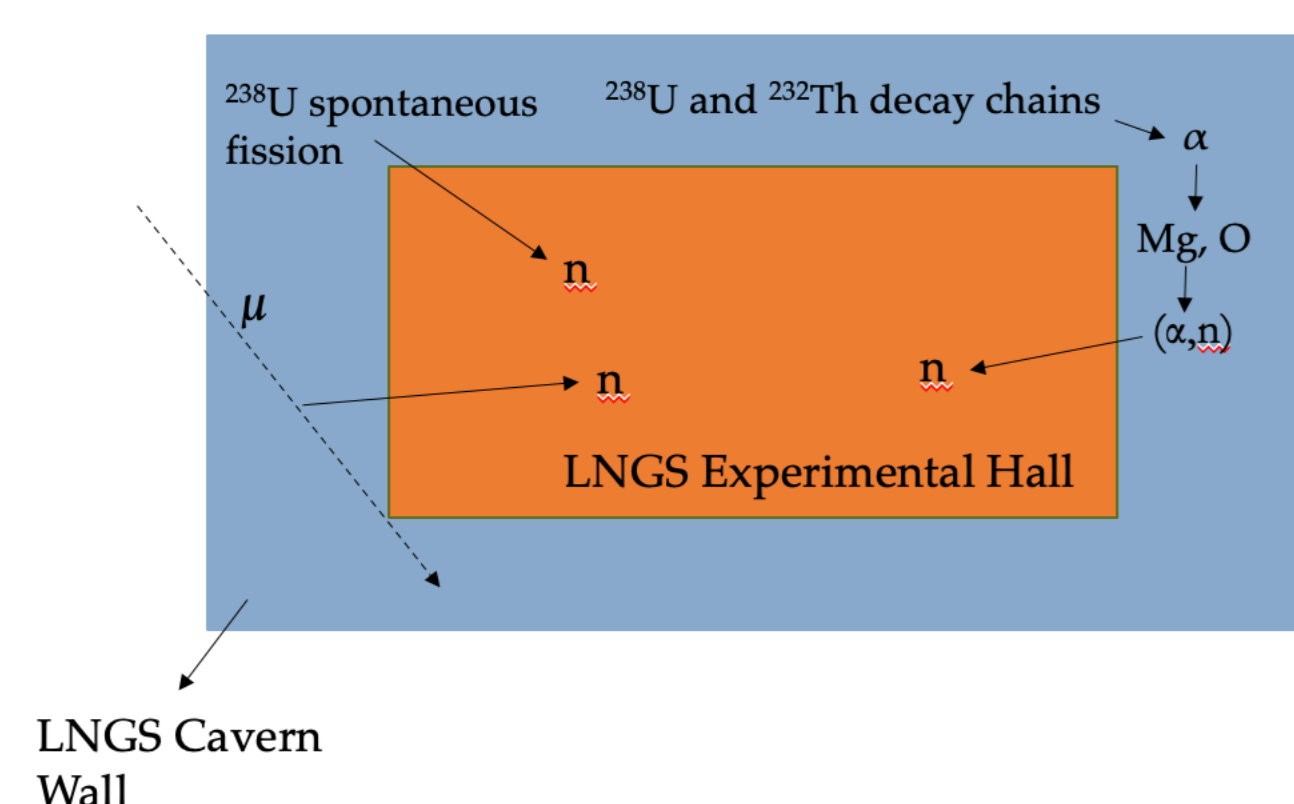


Design of a mobile neutron spectrometer for the LNGS underground laboratory

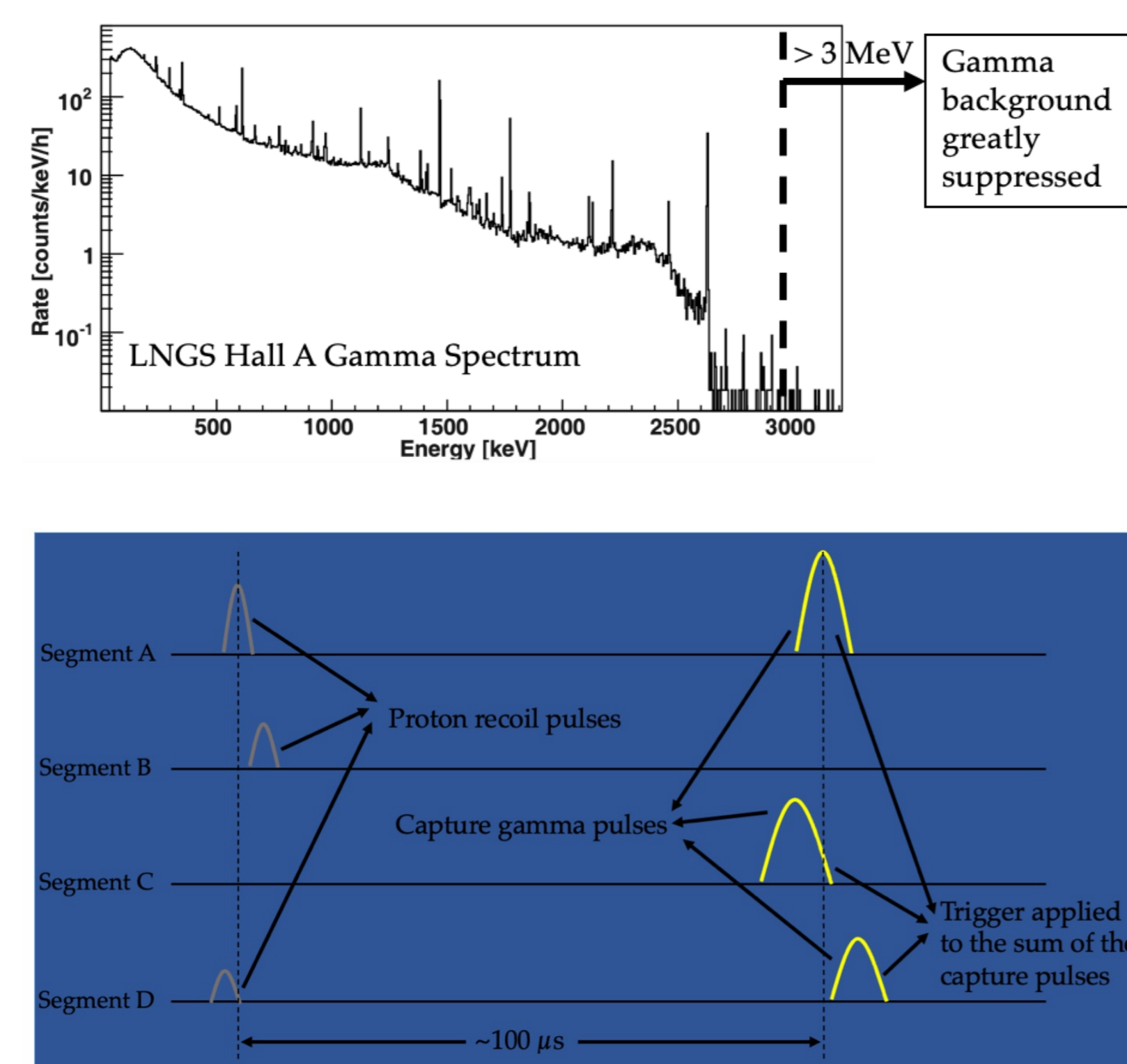
Melih Solmaz, Klaus Eitel, Kathrin Valerius (Karlsruhe Institute of Technology) and Uwe Oberlack (Johannes Gutenberg University Mainz)

Ambient neutrons induce background at LNGS

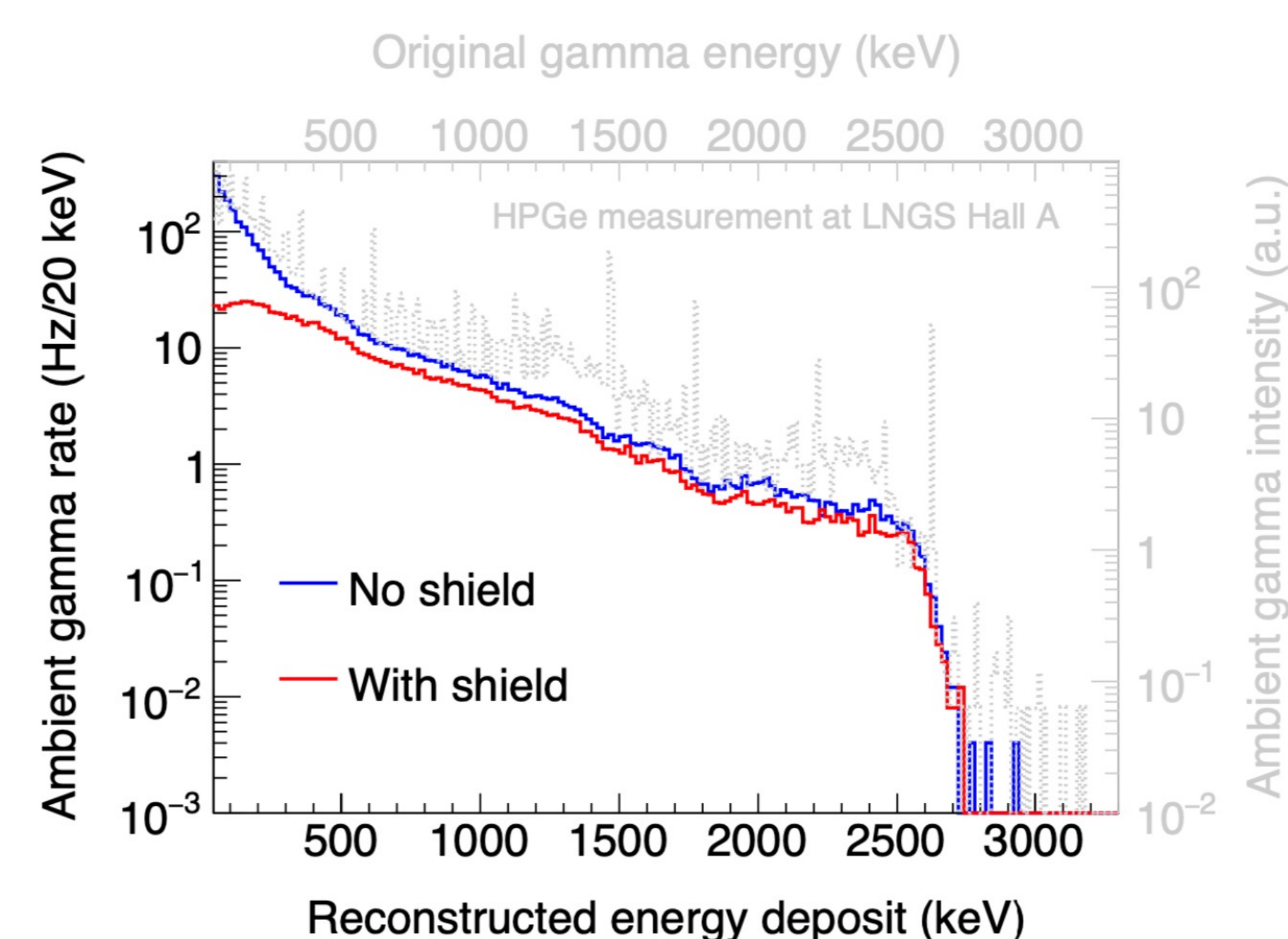
The low background experiments at LNGS are susceptible to environmental neutrons. Neutron flux and spectrum depend on both location and time.



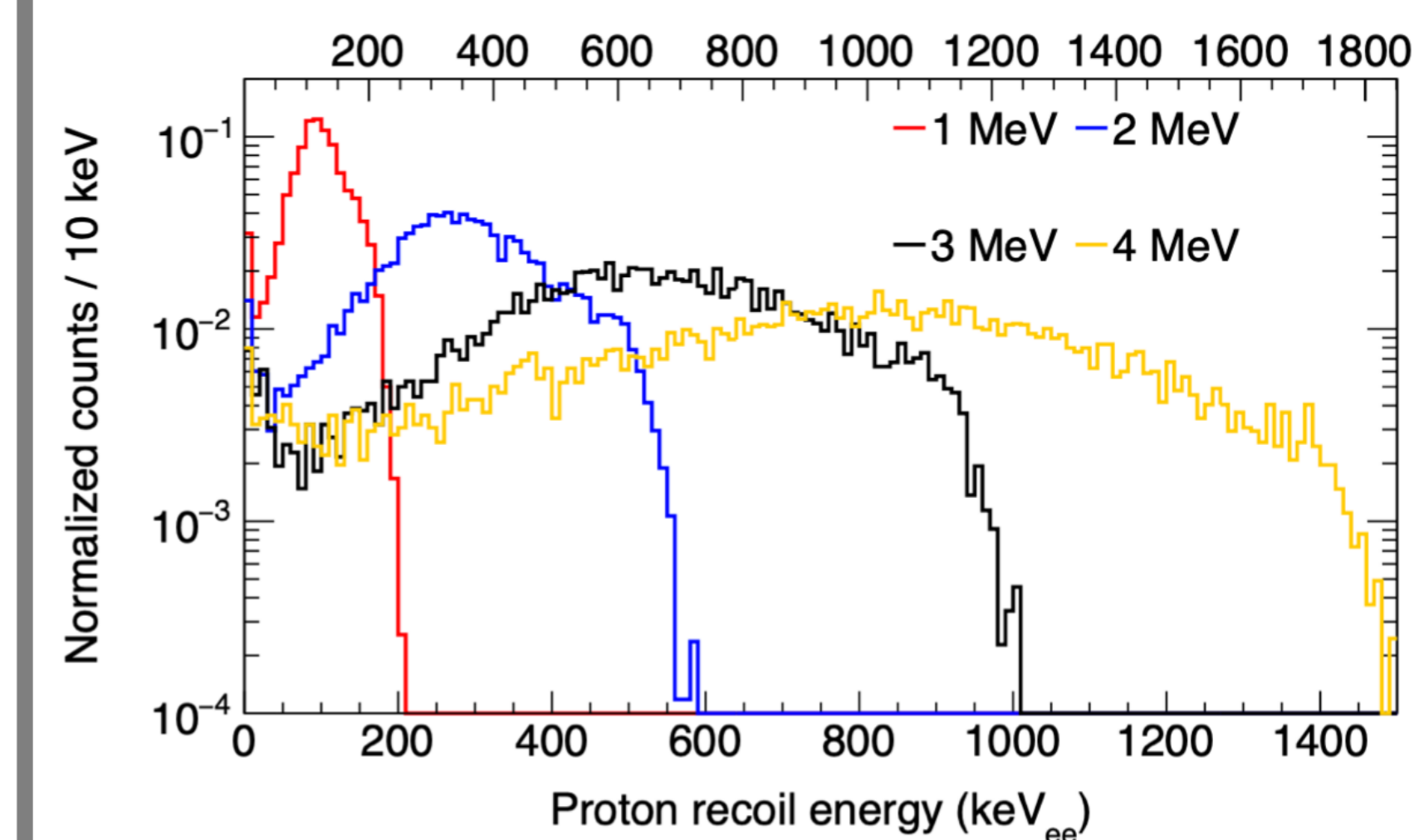
Trigger scheme



Simulated detector response to the ambient gammas

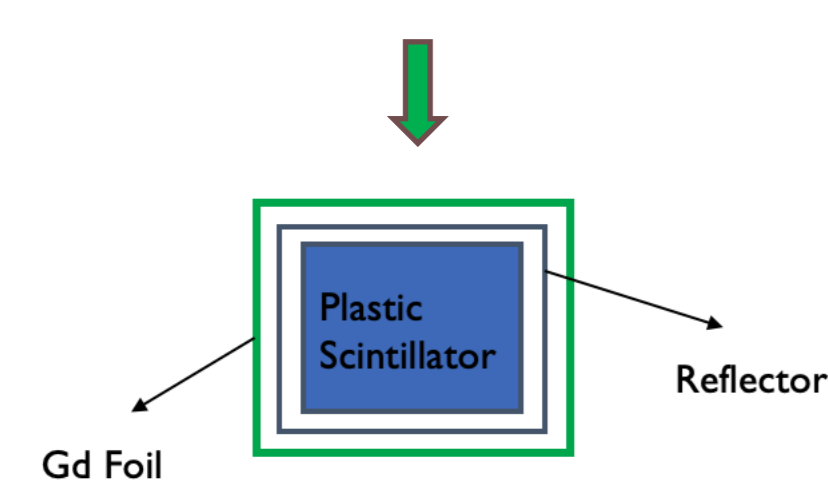
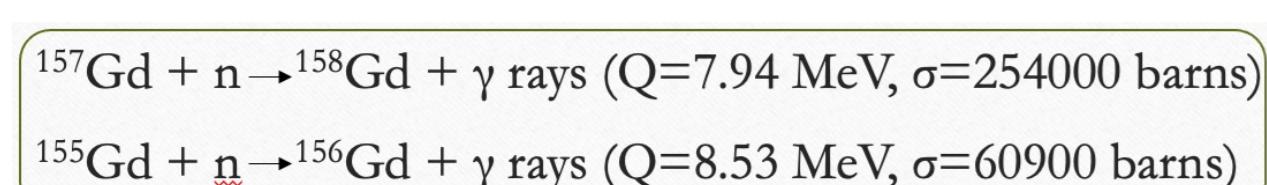


Simulated proton recoil spectra

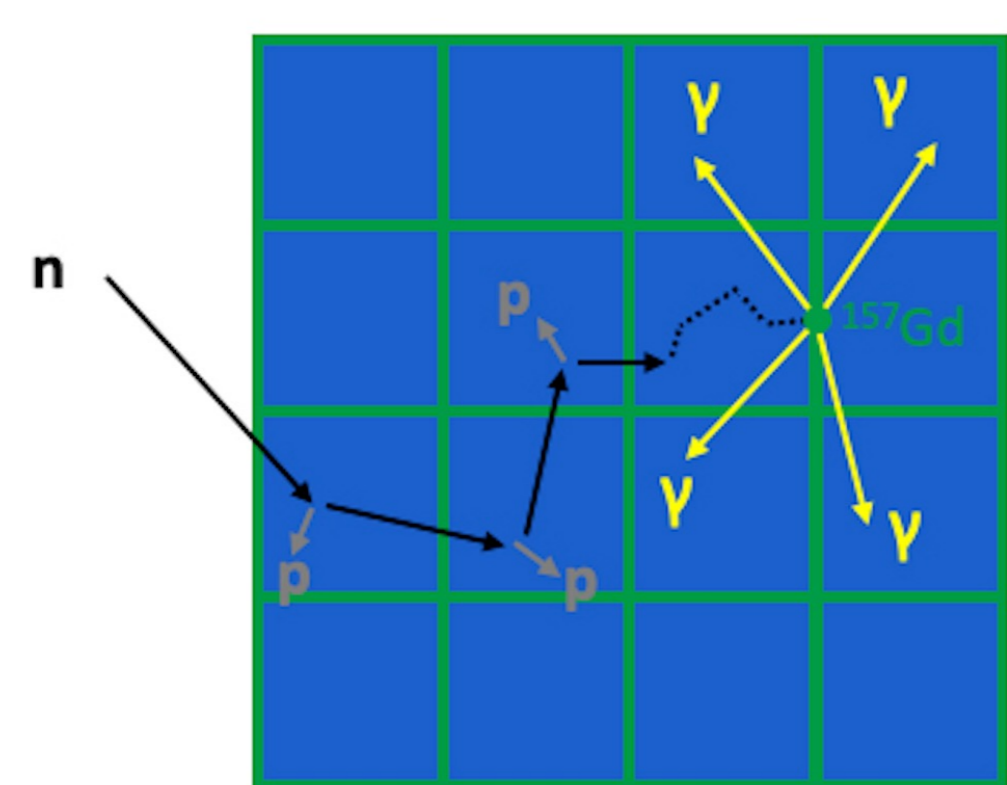


A neutron threshold of 1 MeV is feasible

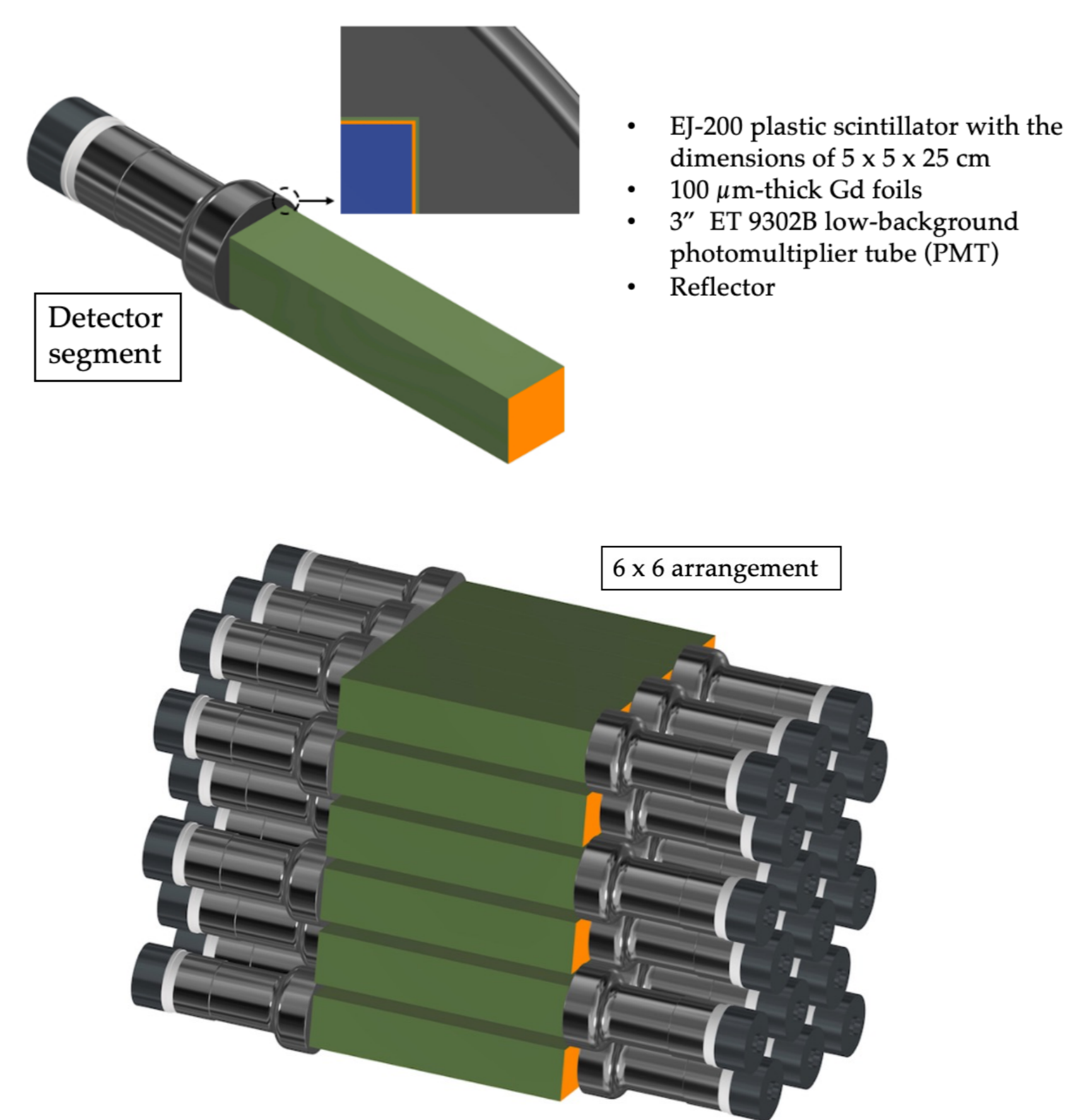
Gadolinium-based capture-gated neutron spectroscopy



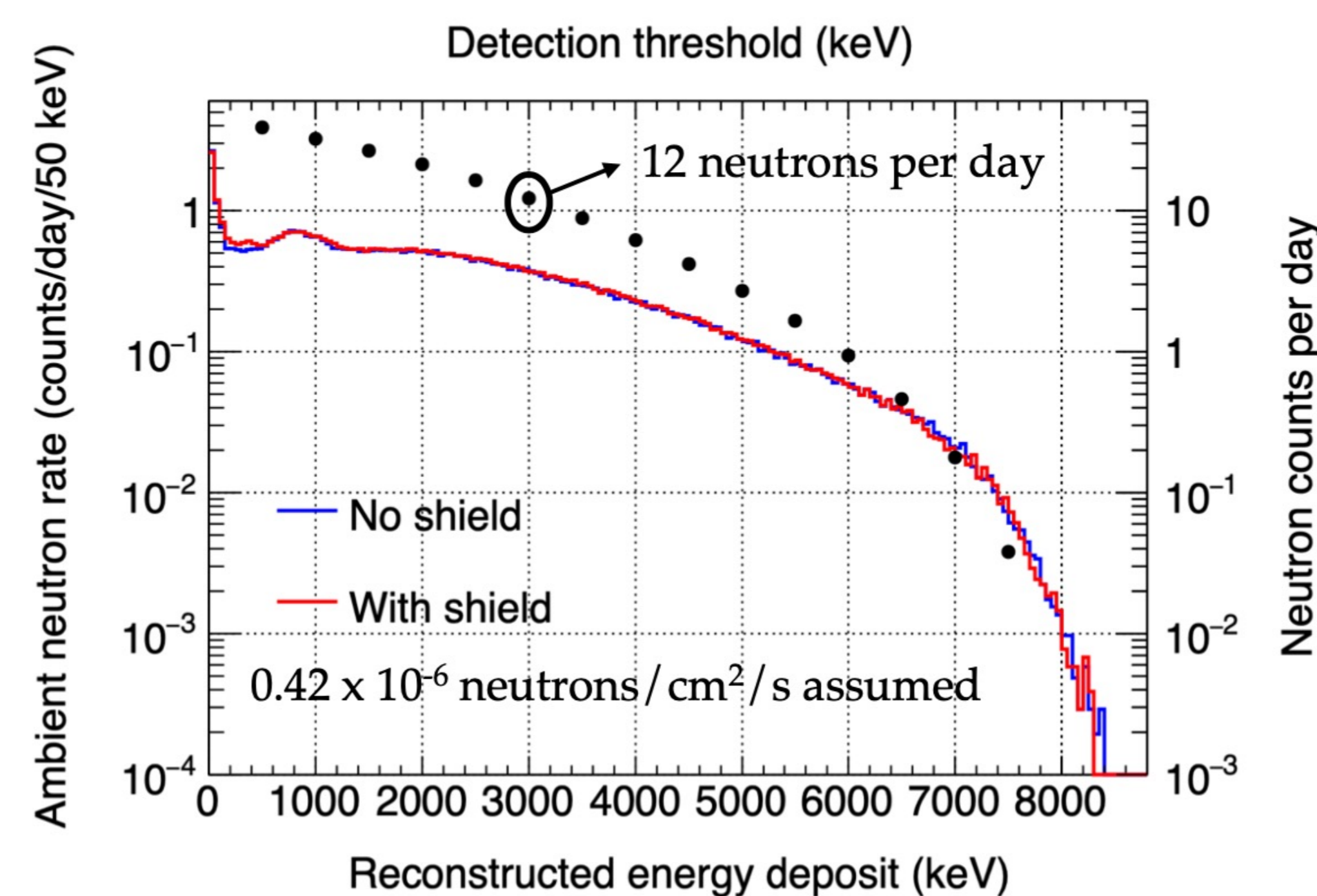
SEGMENTED DESIGN



Detector layout



Simulated detector response to the ambient neutrons



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