

PANGEA irradiation test at TRIGA

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PANDA Meeting 19/2, 2019-06-24

Why?

- Degradation of HPGe under radiation
 - Develop / optimize correction methods
- Test at COSY not optimal
 - Dynamic range
 - Cooling problems
 - New test desirable

Possible Facilities

COSY

- Knowledge of proton beam
- Similar background
- Difficult to get higher irradiation

TRIGA

- High irradiation possible
- No long wait time
- Ease of access
- Unknown rates

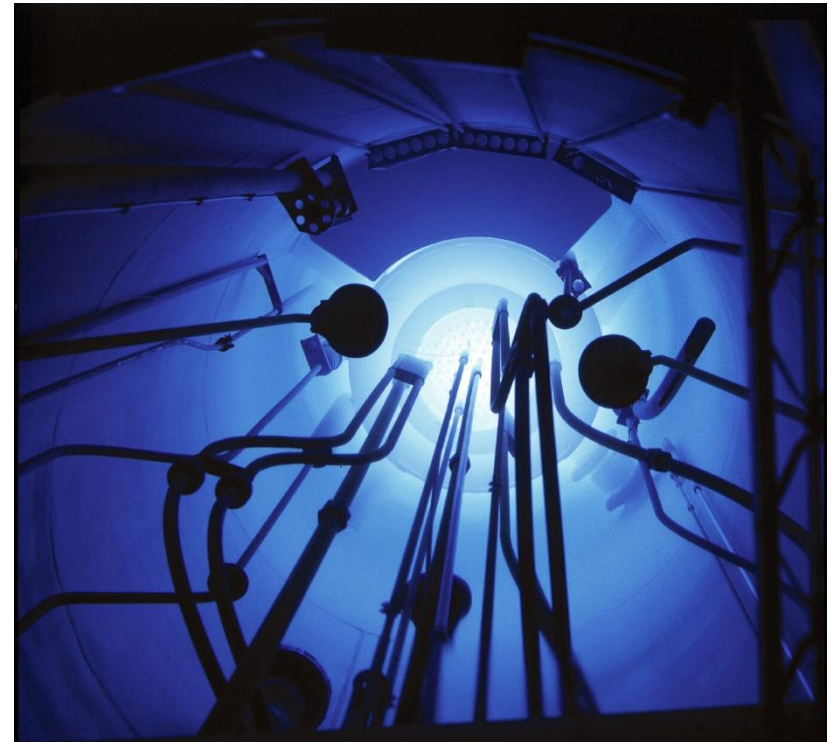
TRIGA Mainz

- Swimming pool reactor
- Available power
100 mW – 100 kW
- 4 beam tubes
- thermal column
- rotary specimen rack

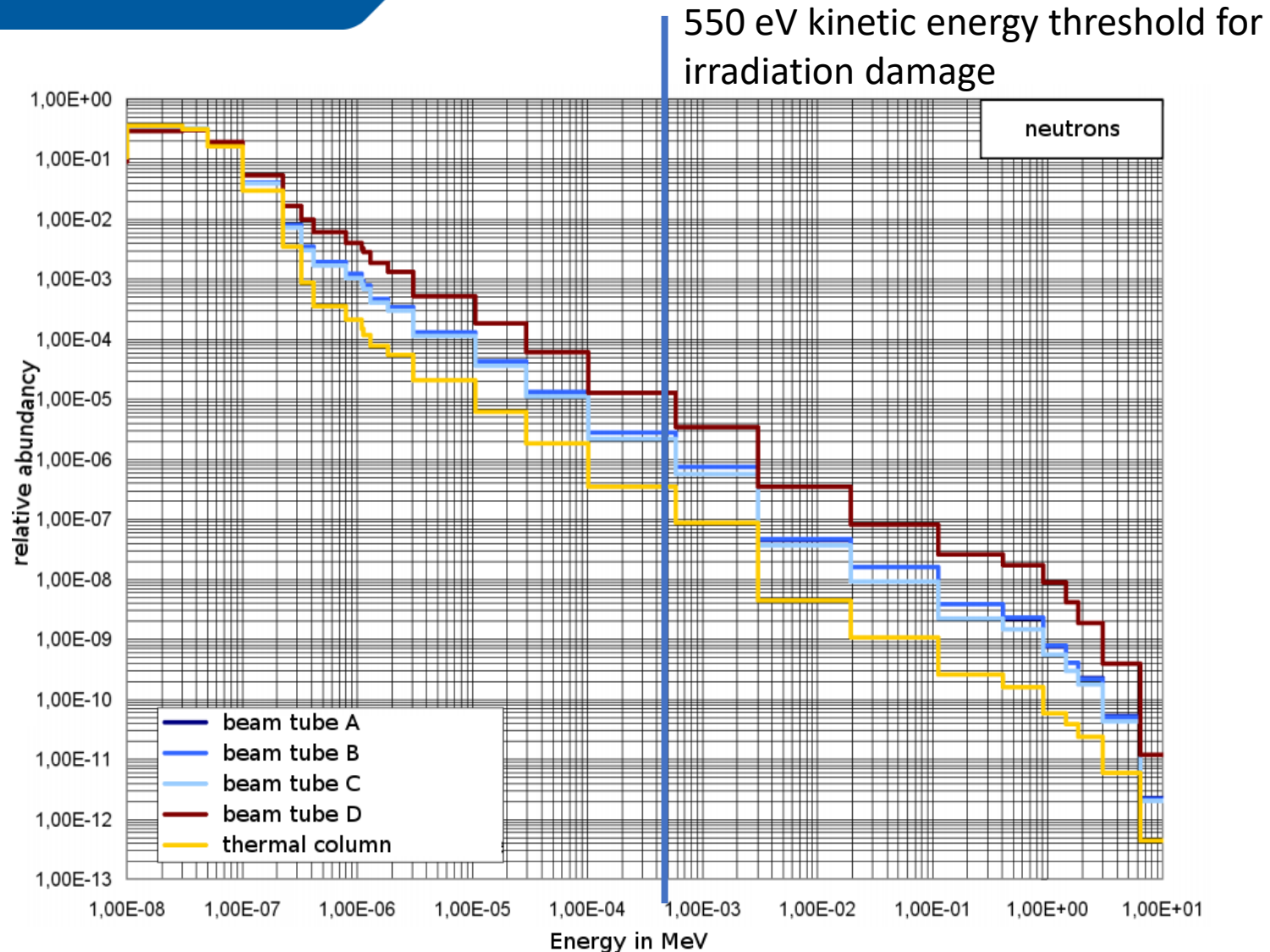


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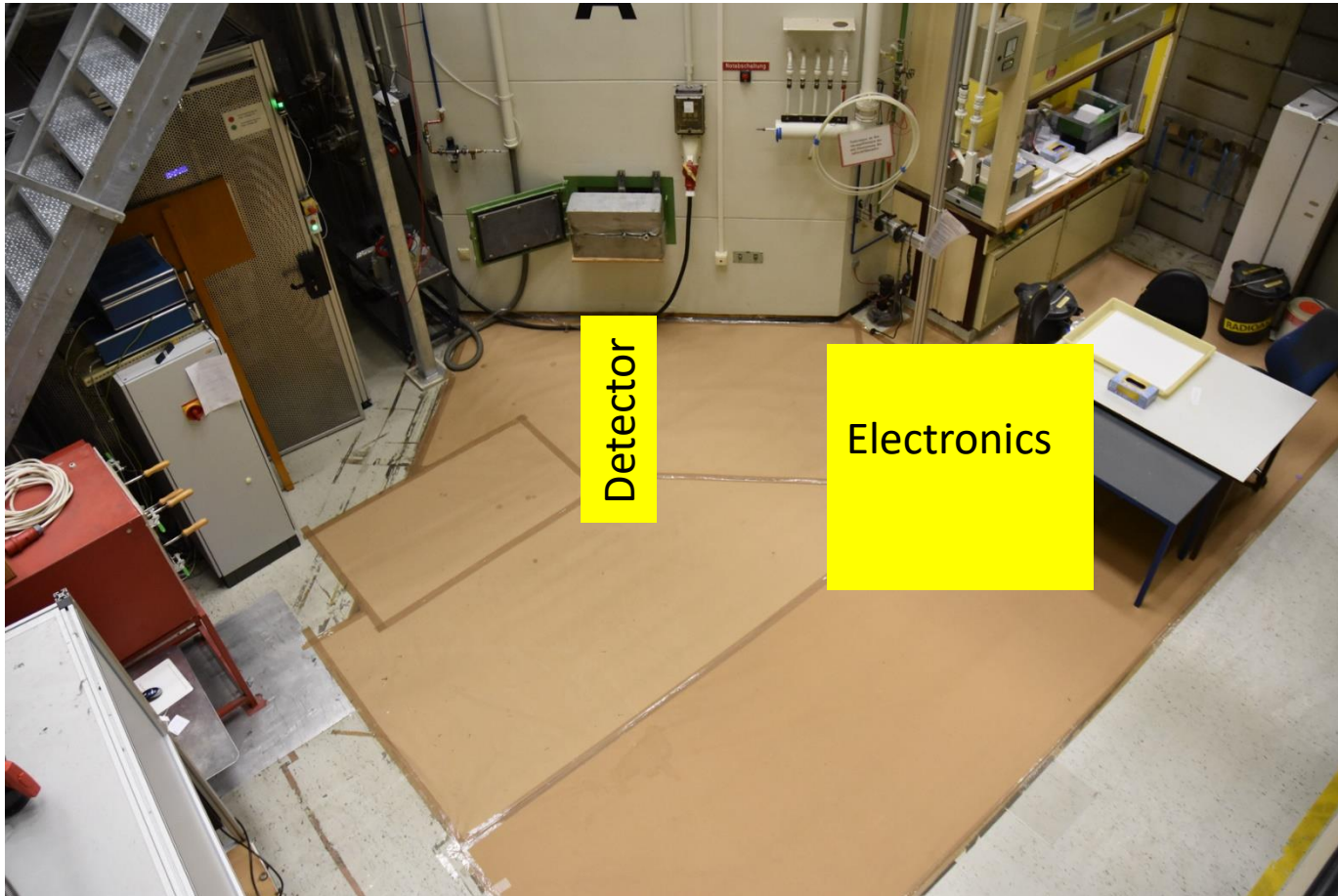


Neutron spectrum



Quelle: <http://nbn-resolving.de/urn:nbn:de:bsz:14-qucosa-231889>

TRIGA beam tube A

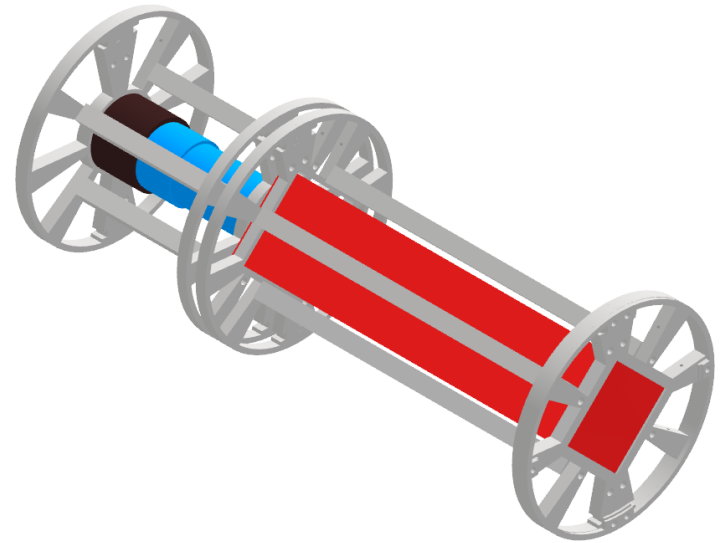


Fast neutrons @ TRIGA?

- Three steps
 1. Measuring total rate
 2. Measuring fast neutron rate
 3. HPGe Irradiation

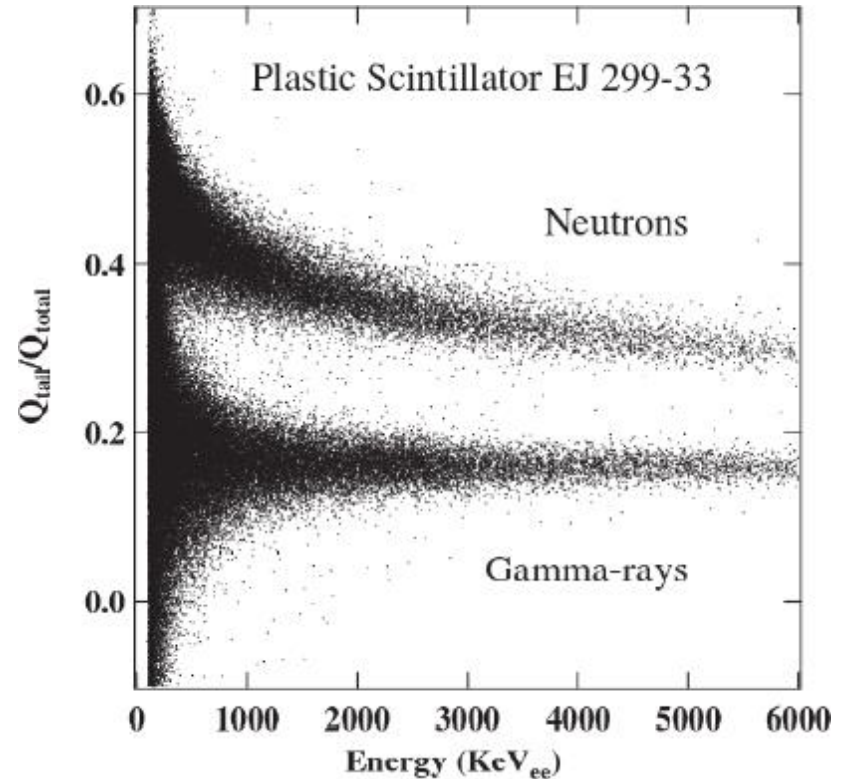
Total Rate

- Existing hardware – fast test (hours)
- Simple DAQ
- Slow neutron / γ shielding ?



Fast neutron rate

- Similar setup
- Adjust power of TRIGA
- Scintillator EJ276
 - Discriminate fast n and γ
- PSA similar to HPGe analysis
- 1-2 days



Nyibule et. Al. Digital Gamma-Neutron Discrimination with Organce Plastic Scintillator EJ 299-33

HPGe irradiation test

