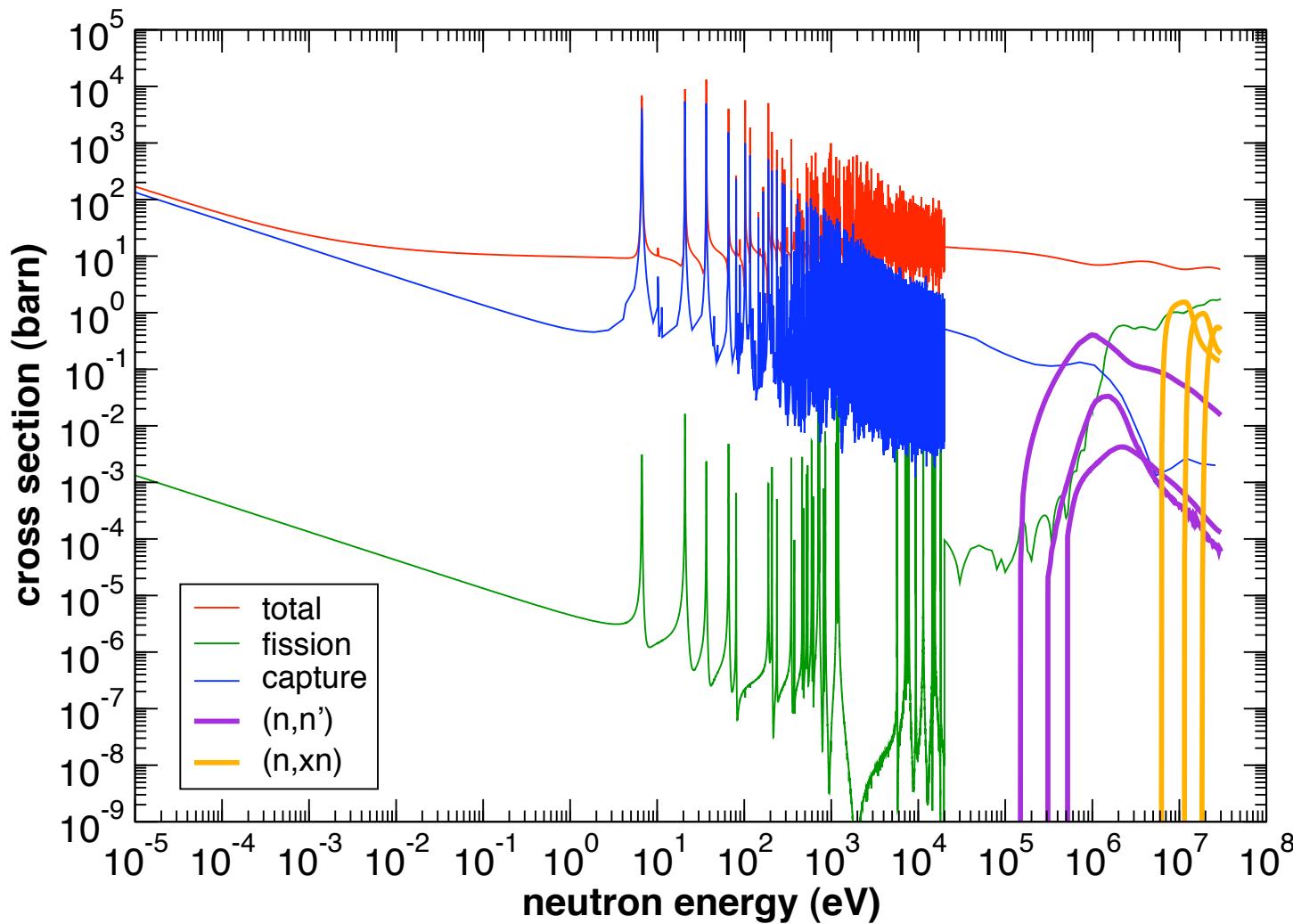
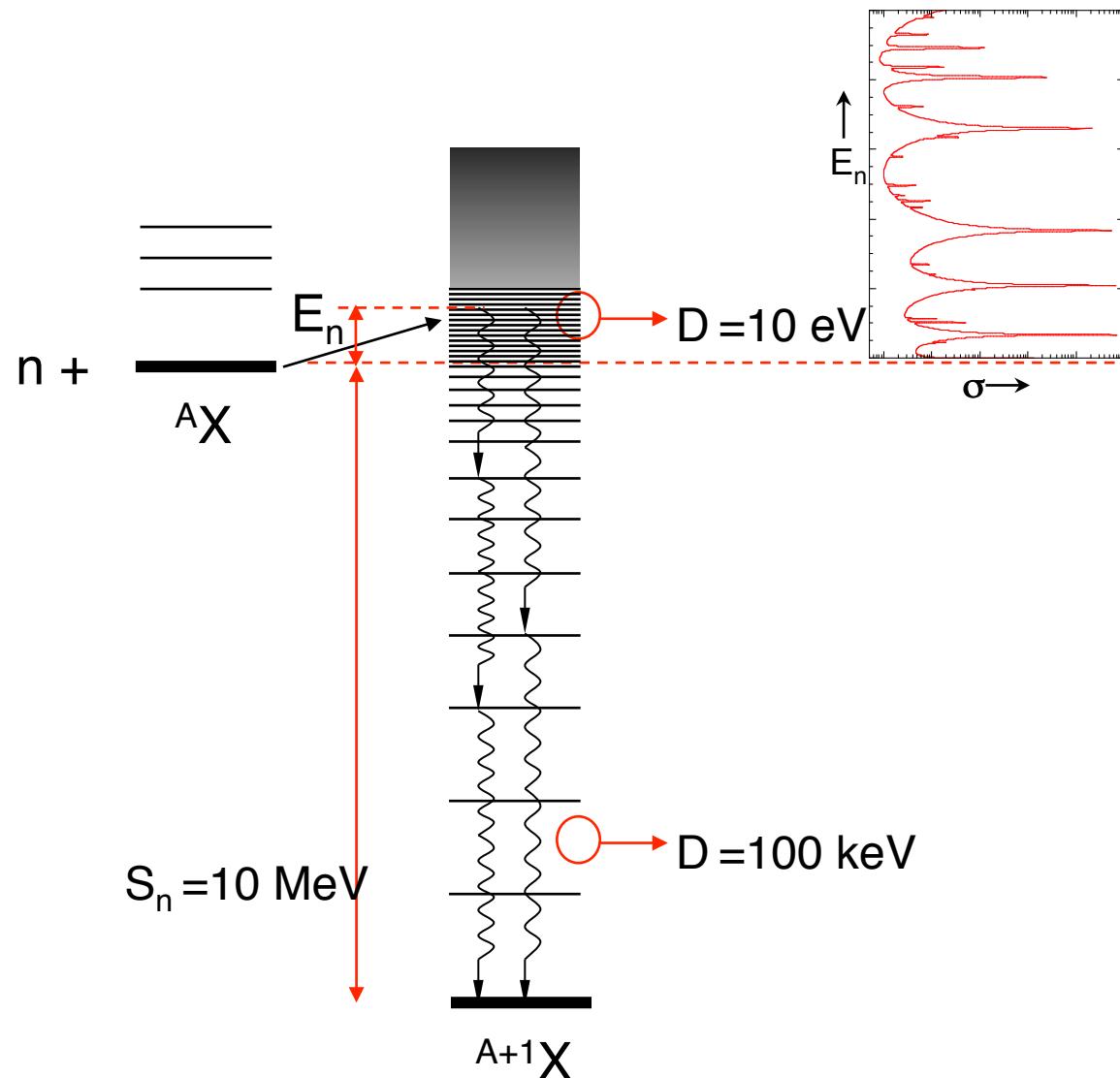
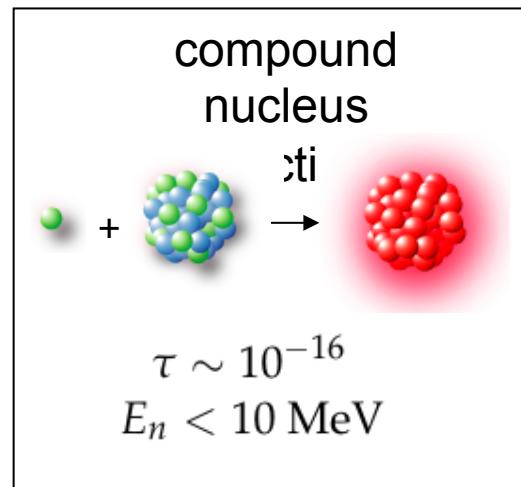


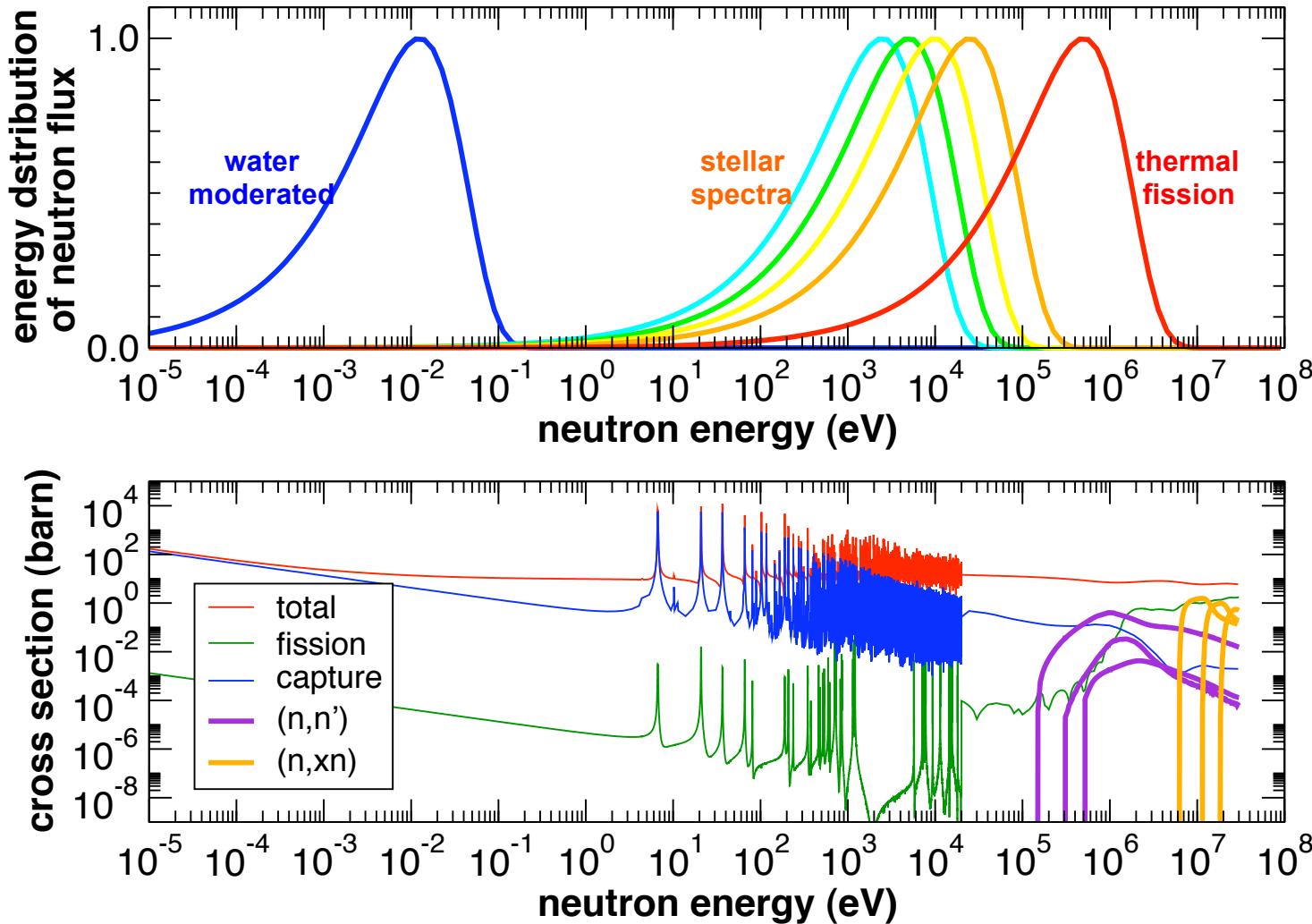
Status of the upgraded neutron time-of-flight facility n_TOF at CERN

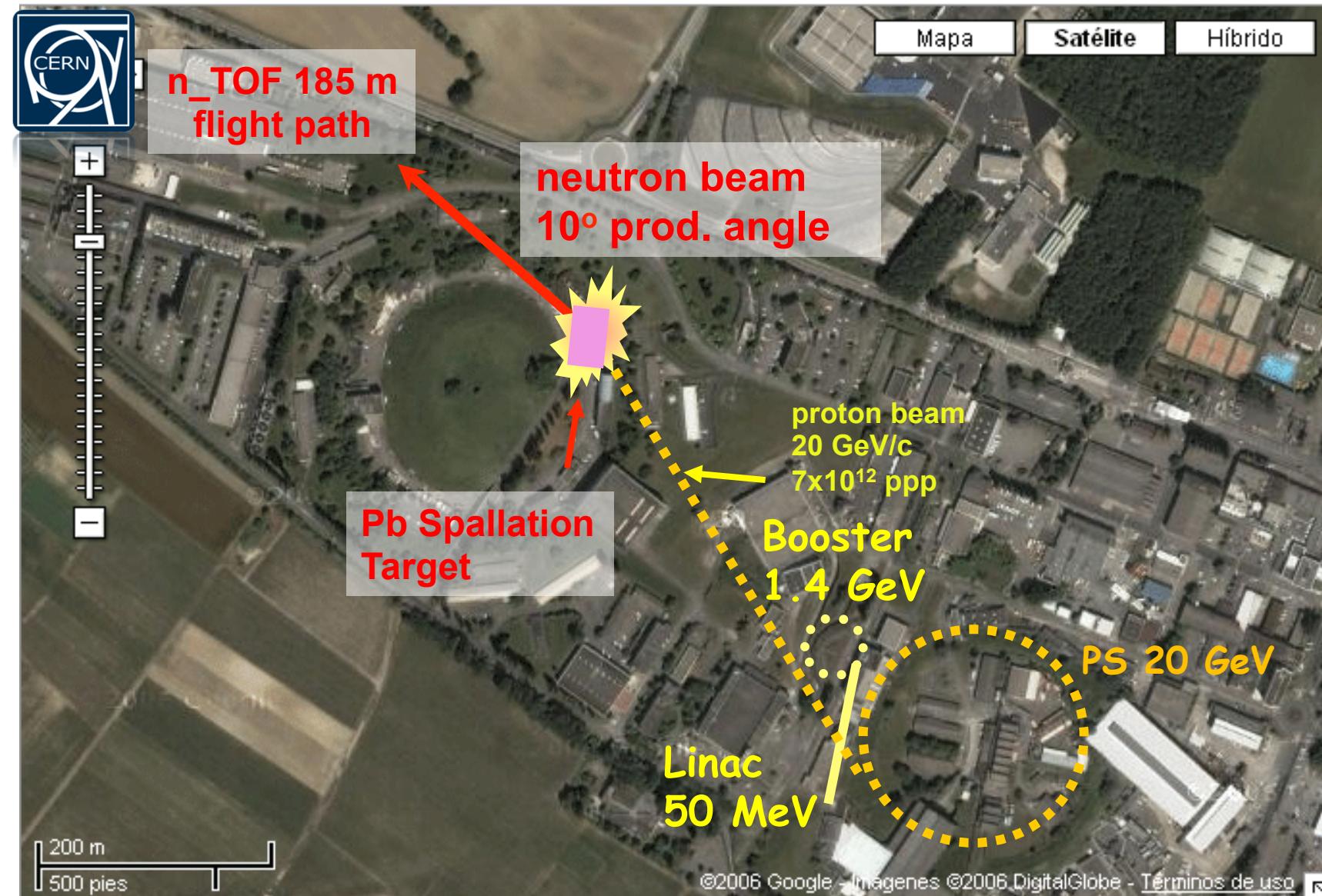
for the n_TOF Collaboration
Frank Gunsing
CEA Saclay

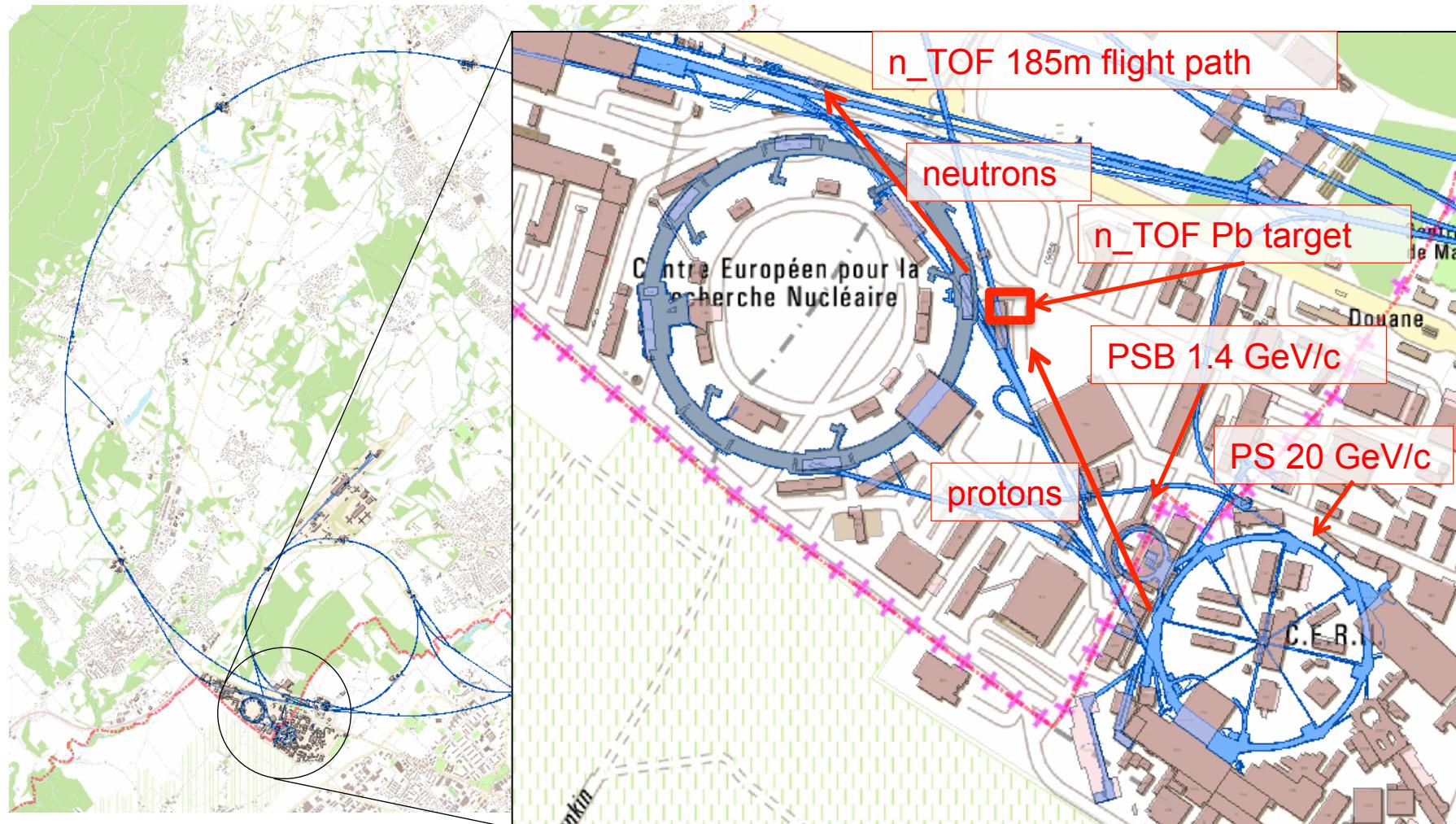
On leave at CERN as n_TOF physics coordinator





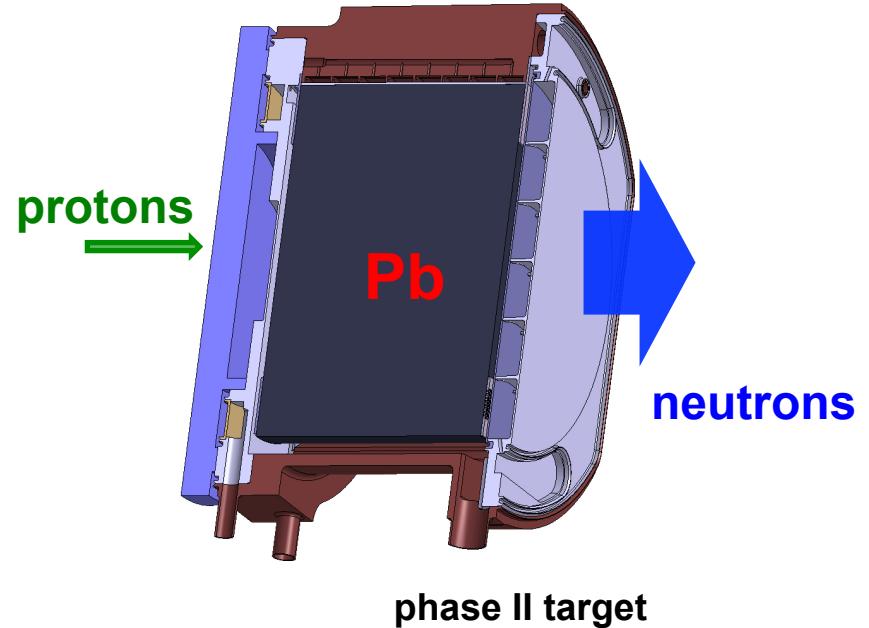






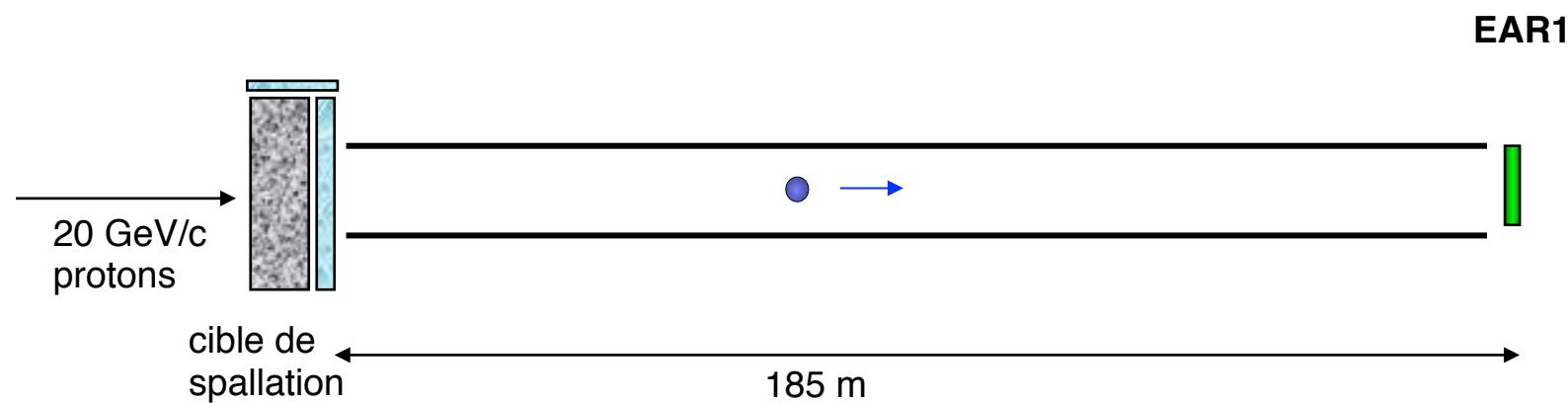
Pulsed white neutron source:

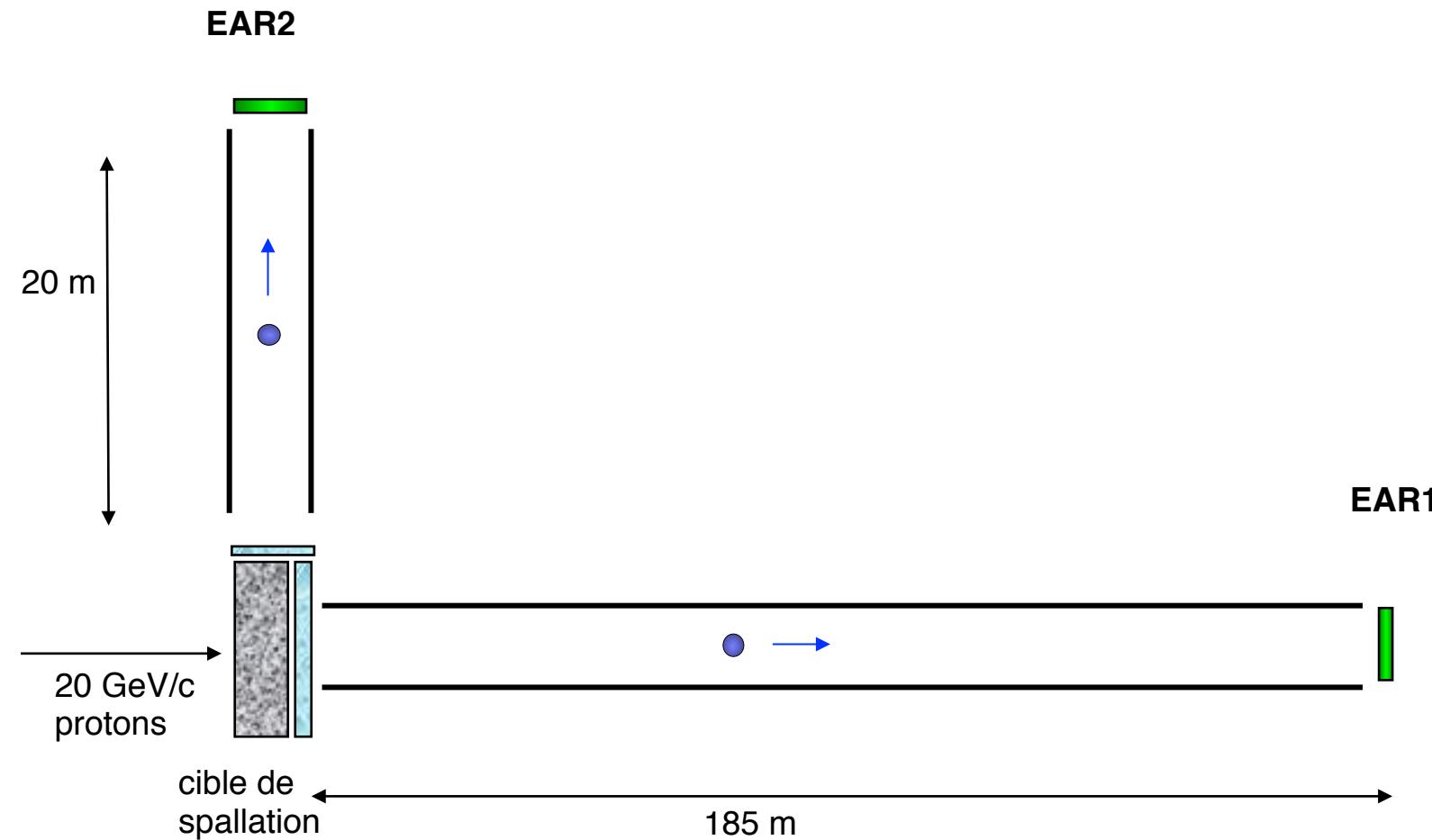
- 20 GeV/c protons
- neutrons from spallation
- 6 ns rms pulse width
- frequency 1 pulse/2.4 seconds
- separate cooling and moderation
- flight path length EAR1: 185 m
- flight path length EAR2: 20 m
- @source: 7×10^{12} protons/pulse
- @source: 2×10^{15} neutrons/pulse
- @EAR1: $5 \cdot 10^5$ (capture) – $5 \cdot 10^7$ (fission) neutrons/pulse



Main features:

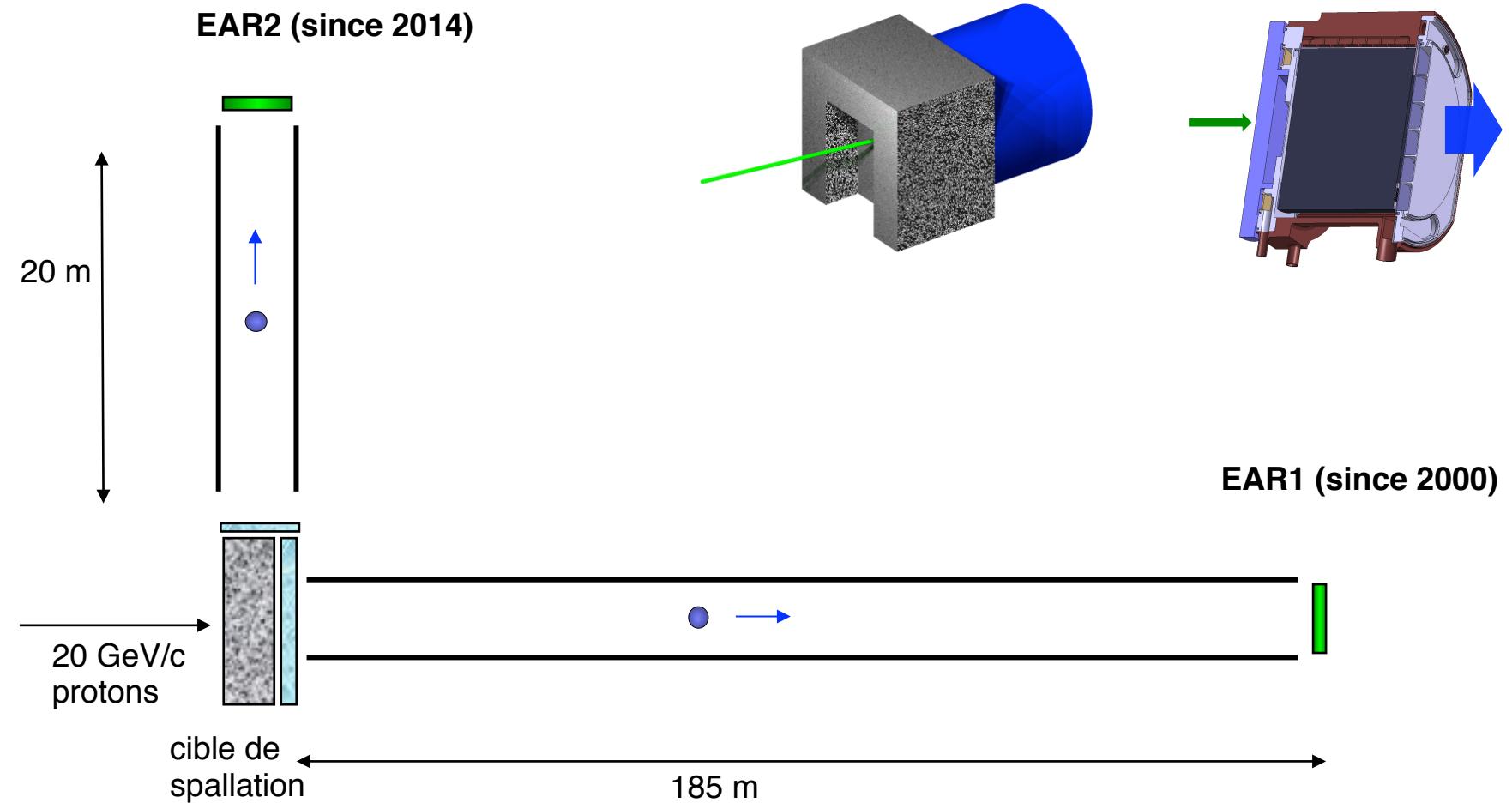
- Large energy range in one experiment (0.1 eV - 250 MeV)
- Favorable signal to noise ratio for capture on radioactive isotopes (actinides, fission products)

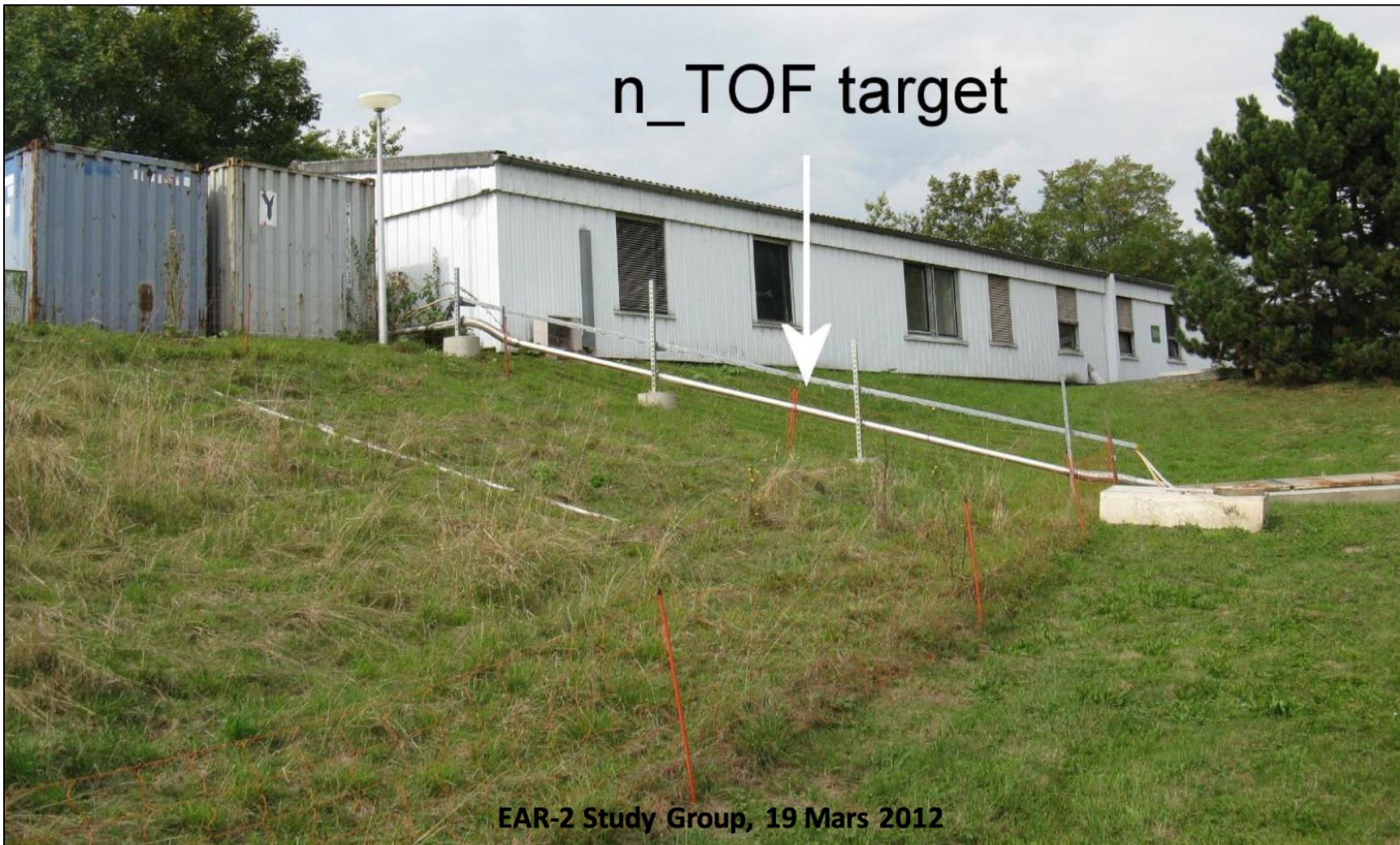




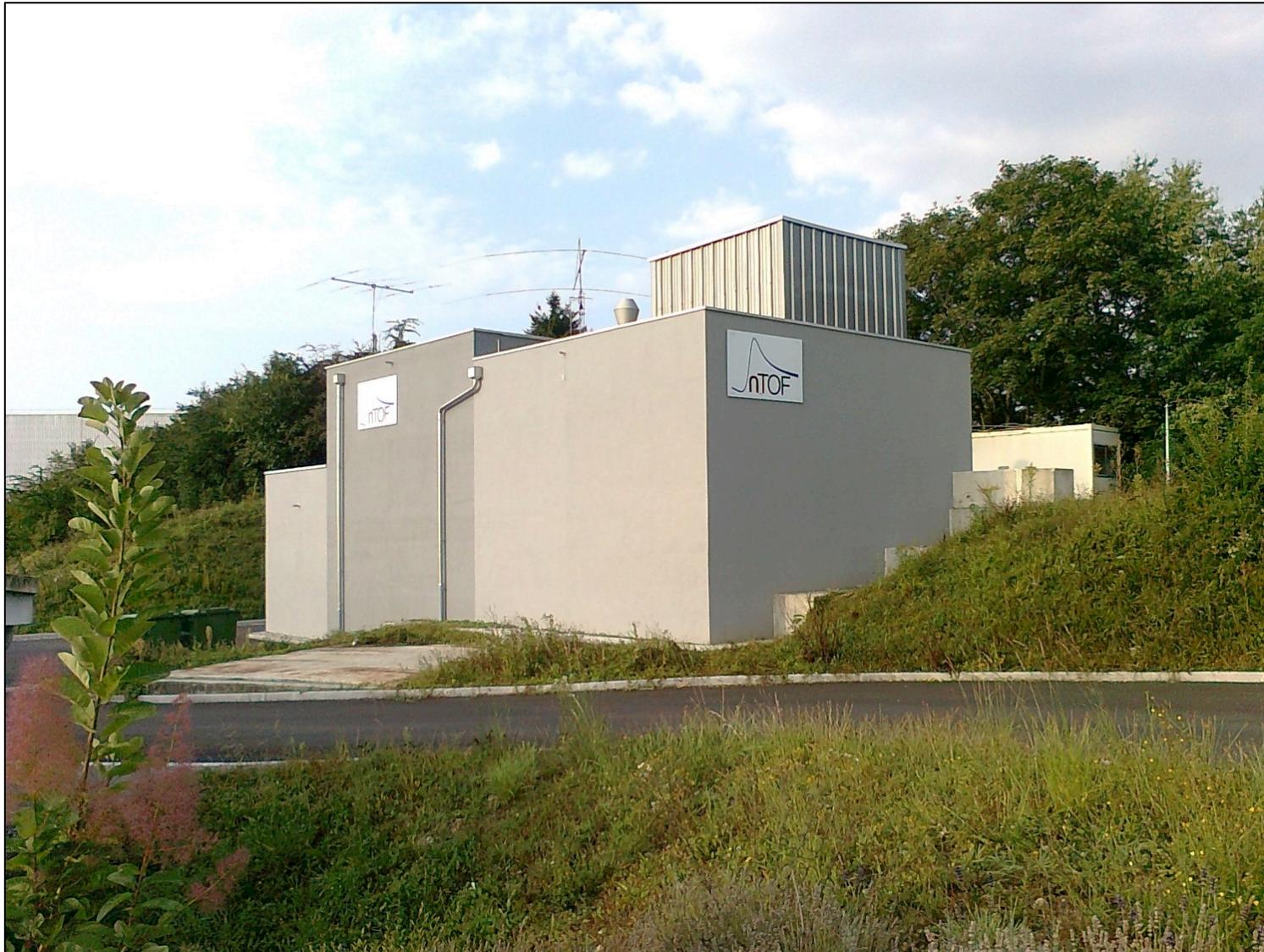
phase I target
2001-2004

phase II target
2009--présent

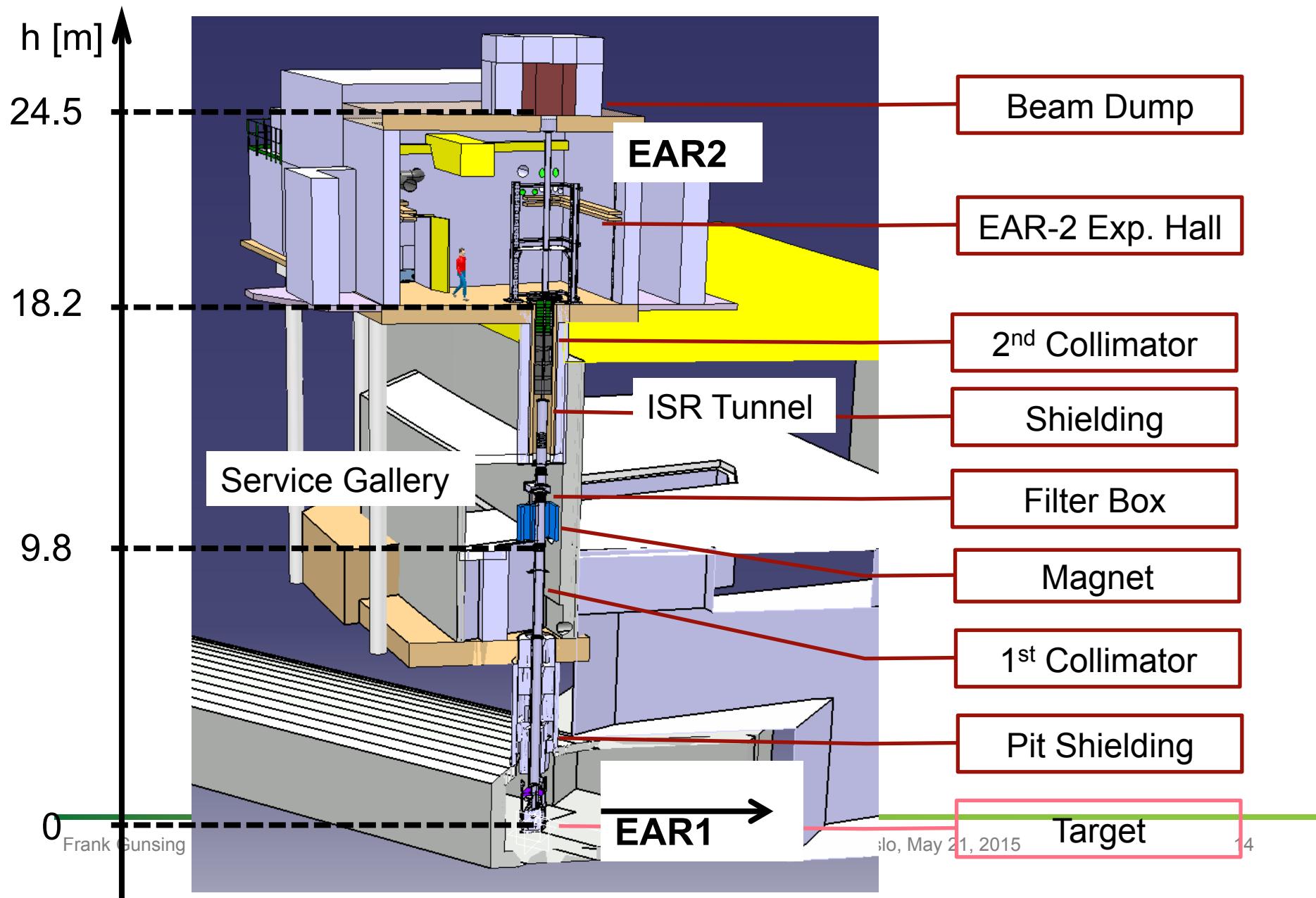




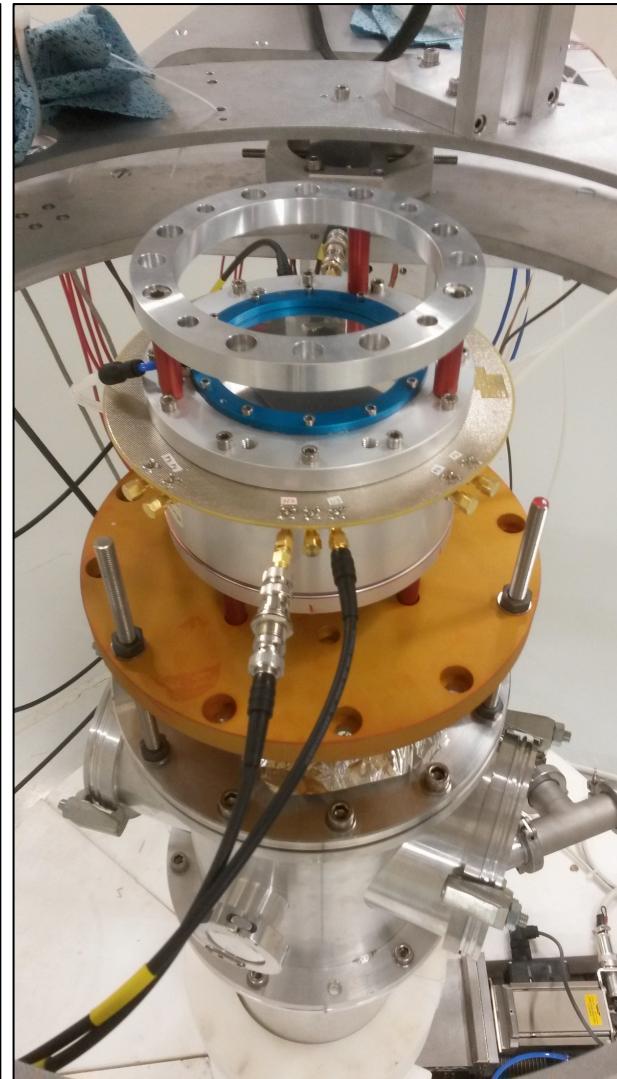
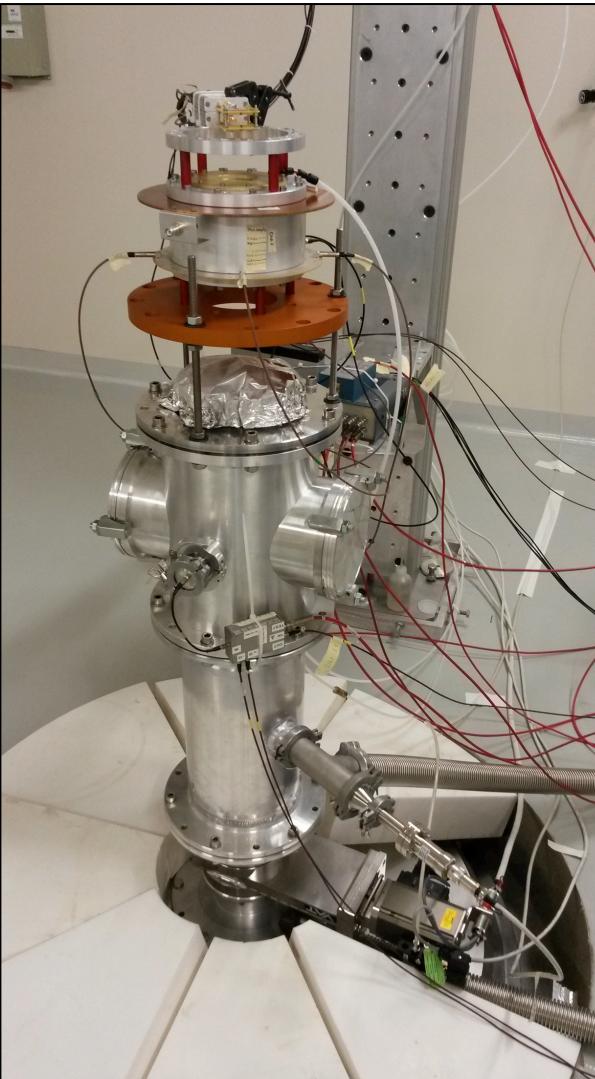
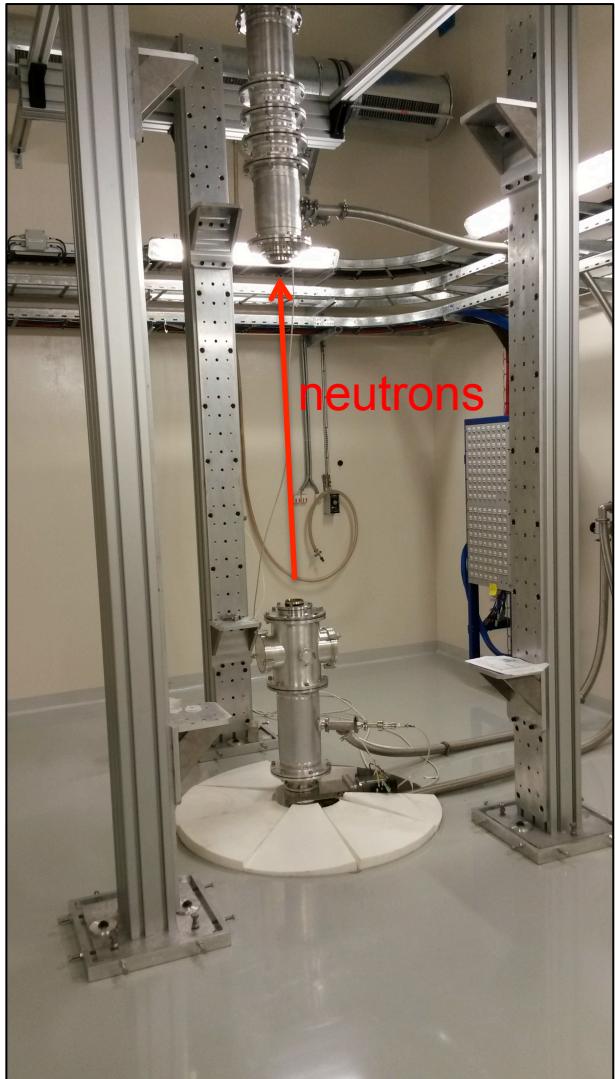


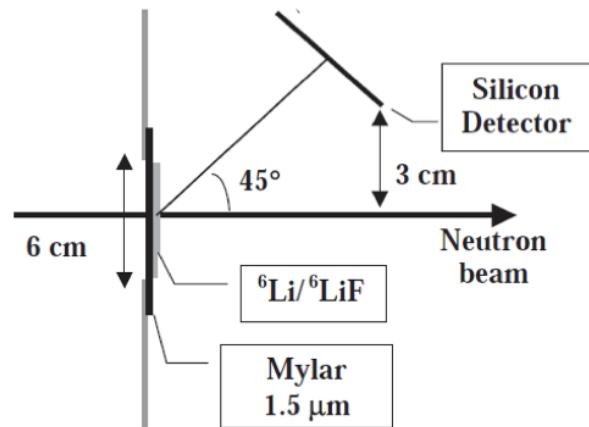


Overview of the n_TOF EAR2

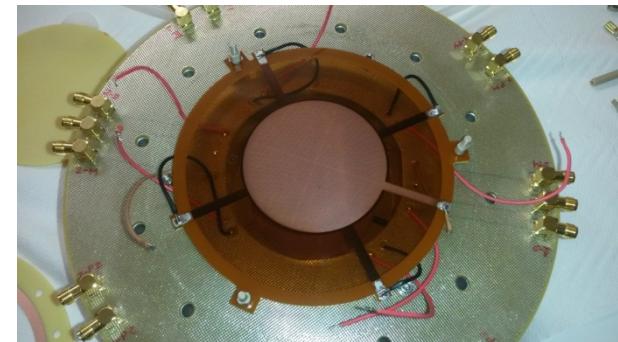
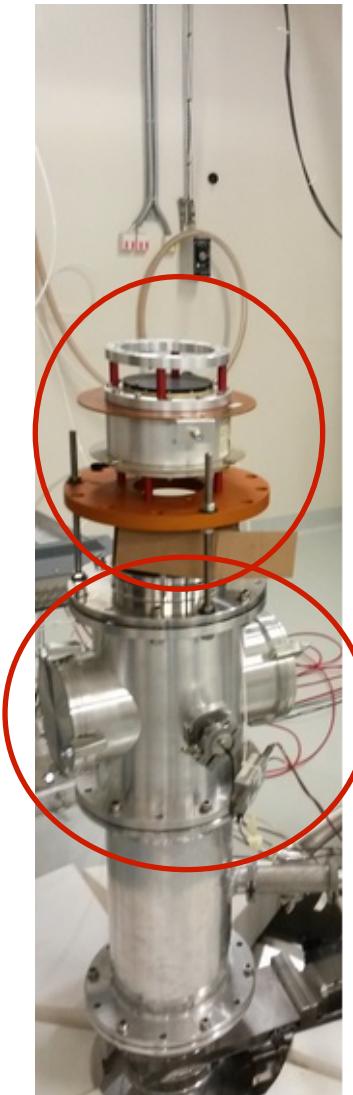
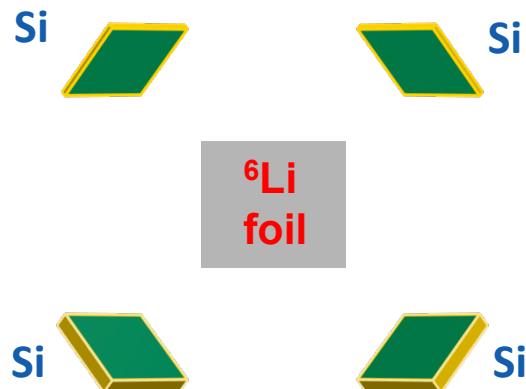


EAR2: neutron beam

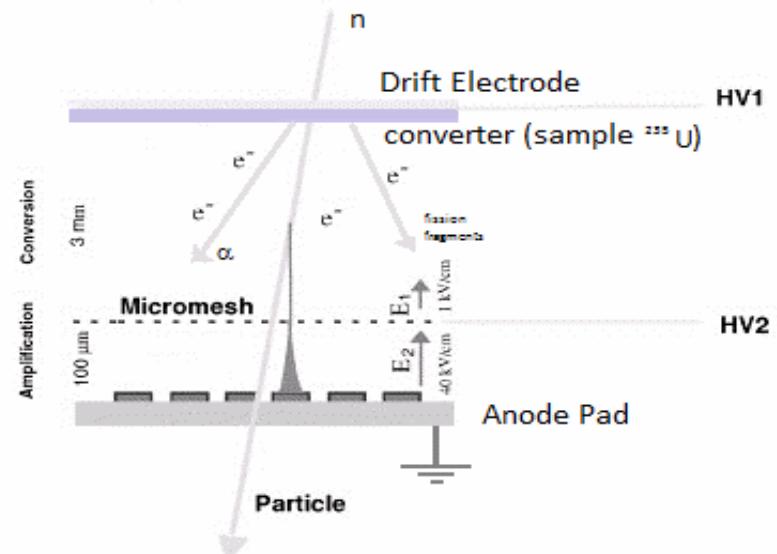


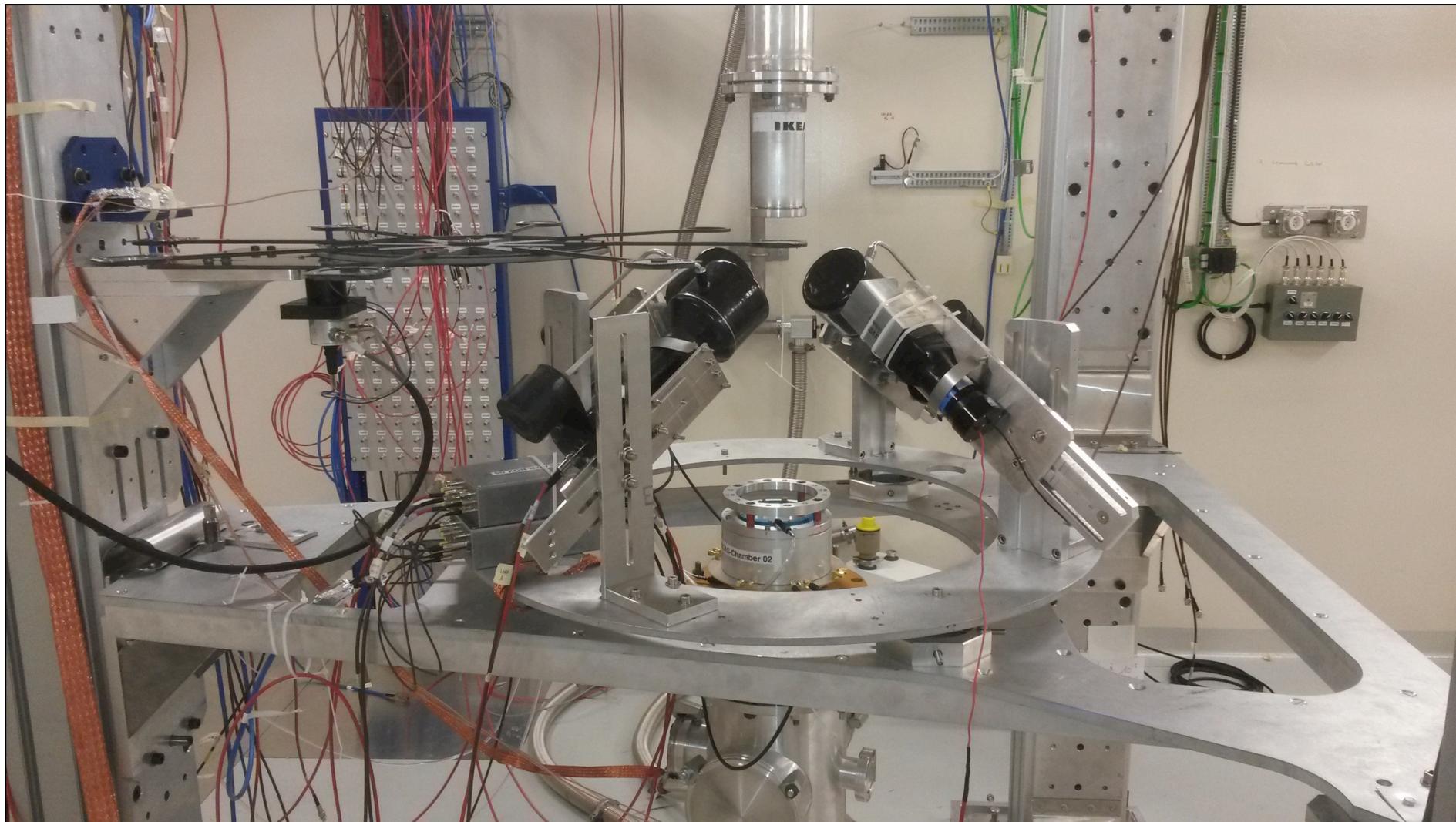


SIMON2

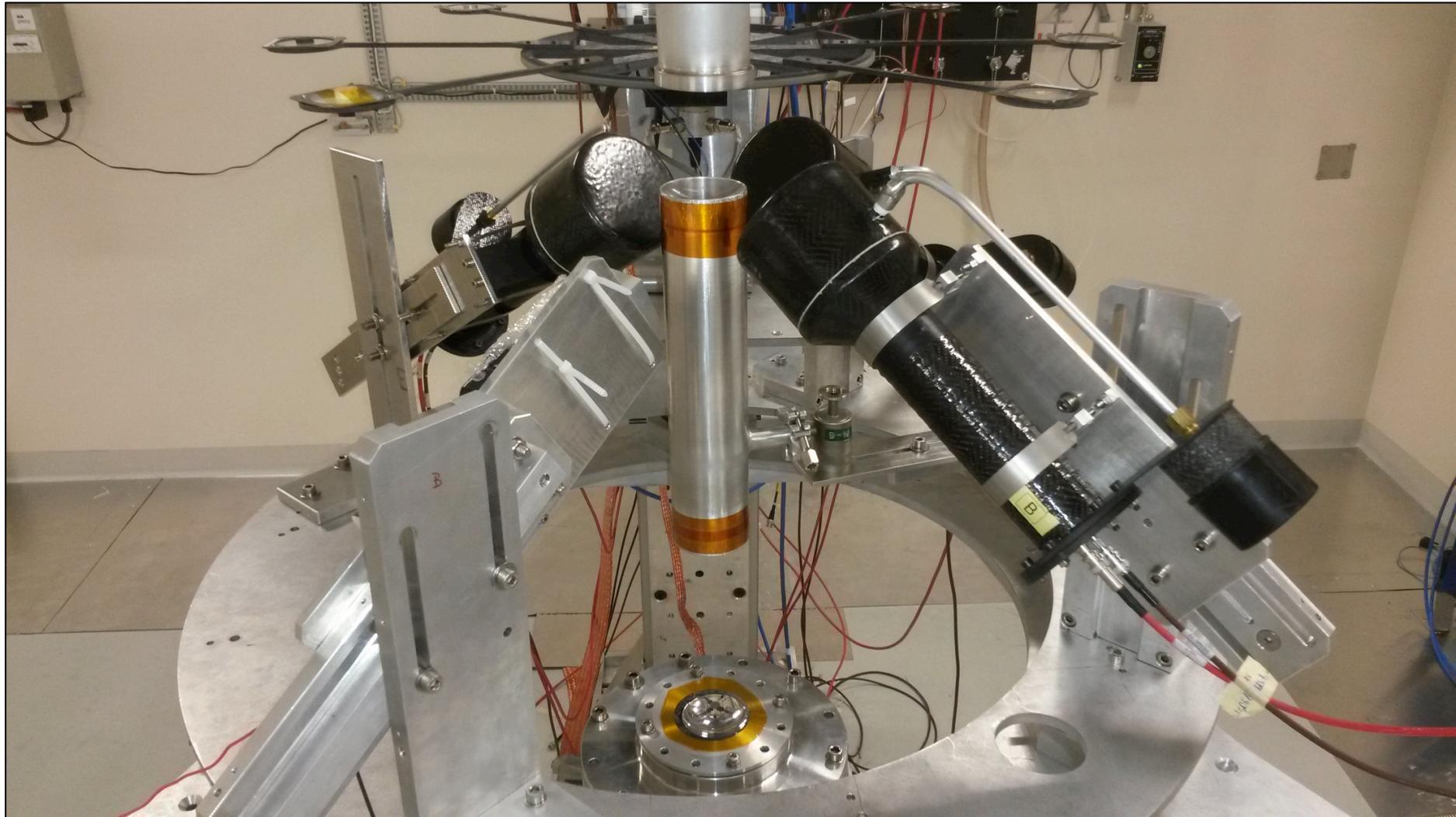


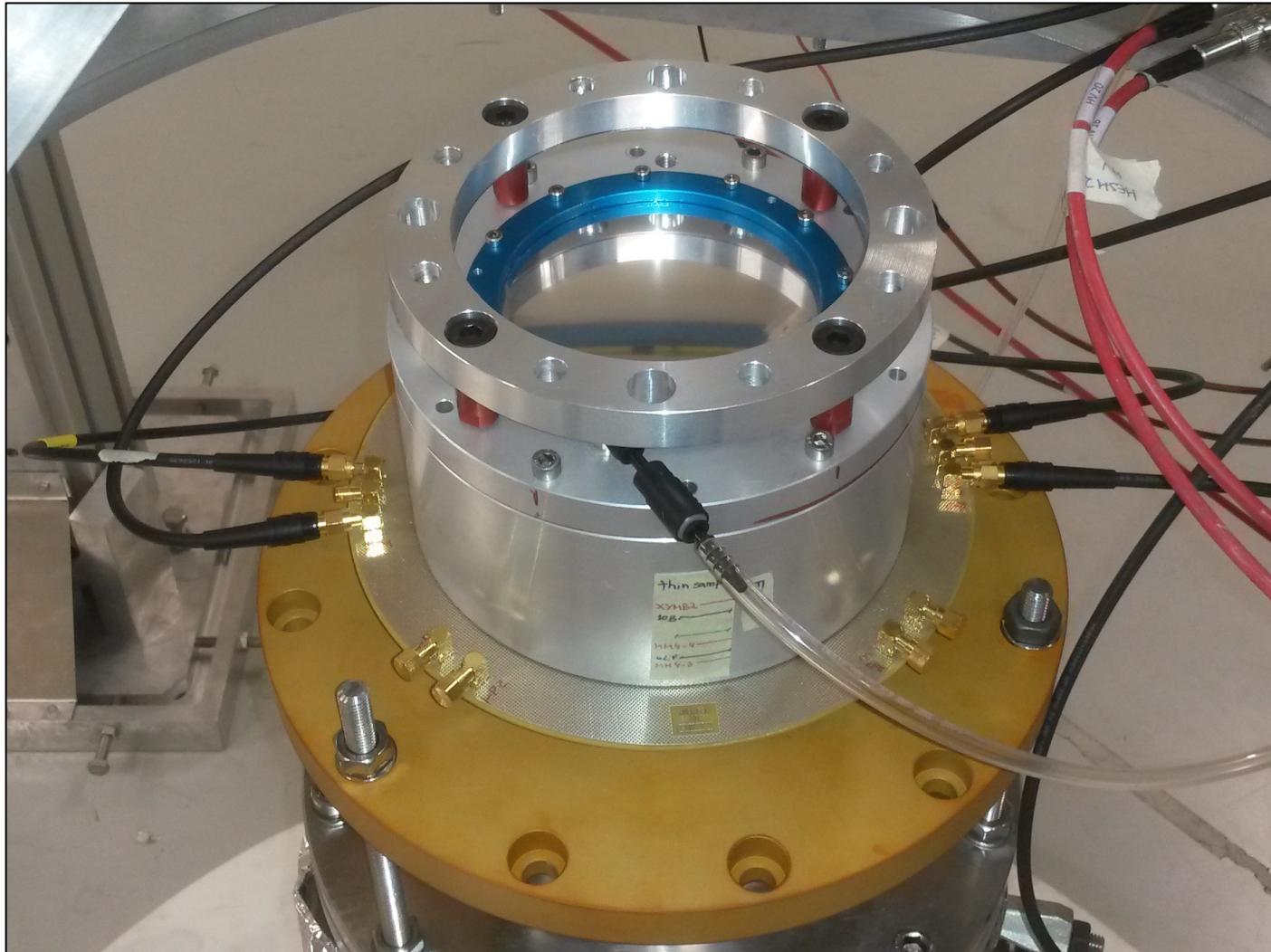
MICROMEGAS

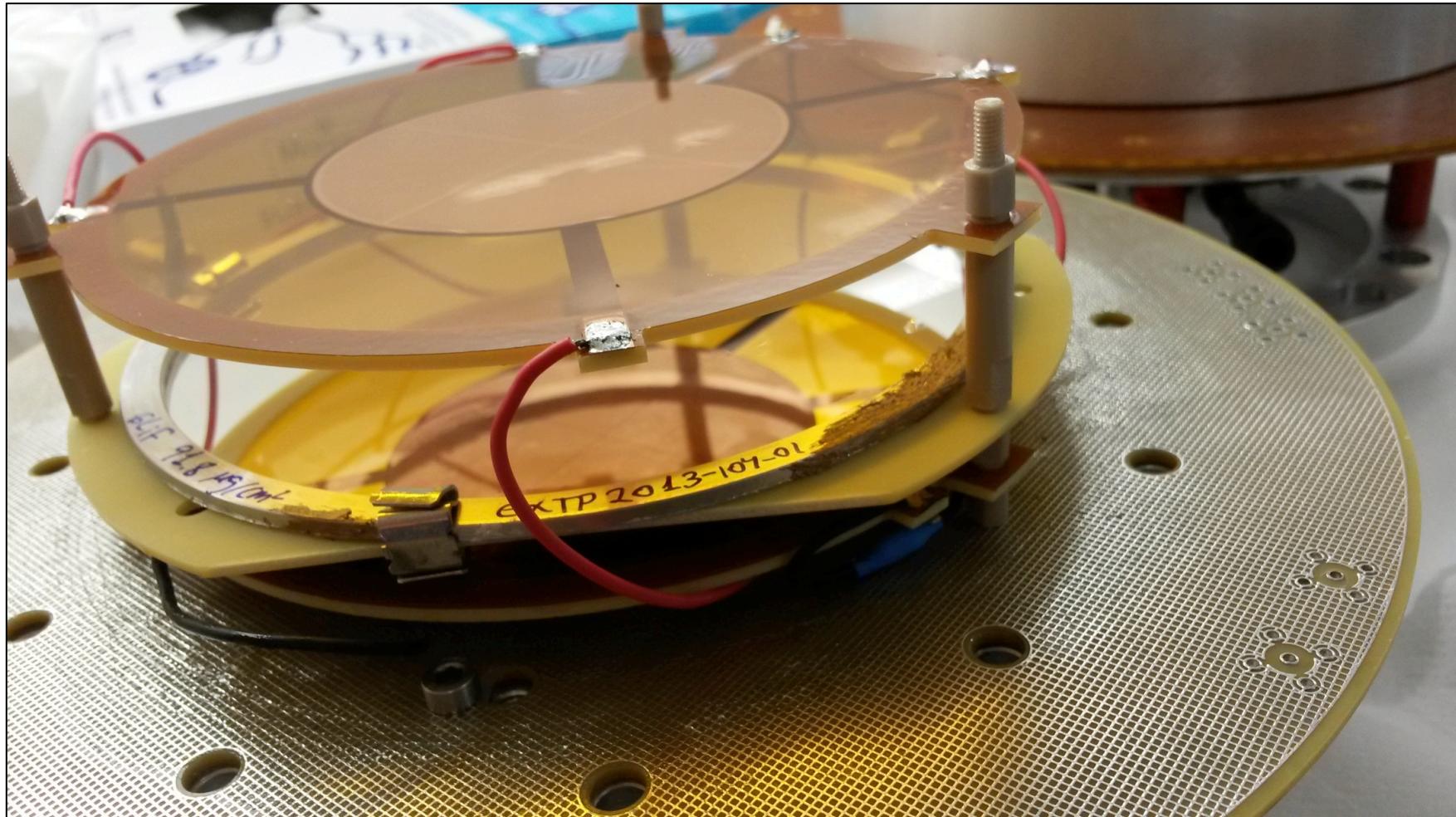


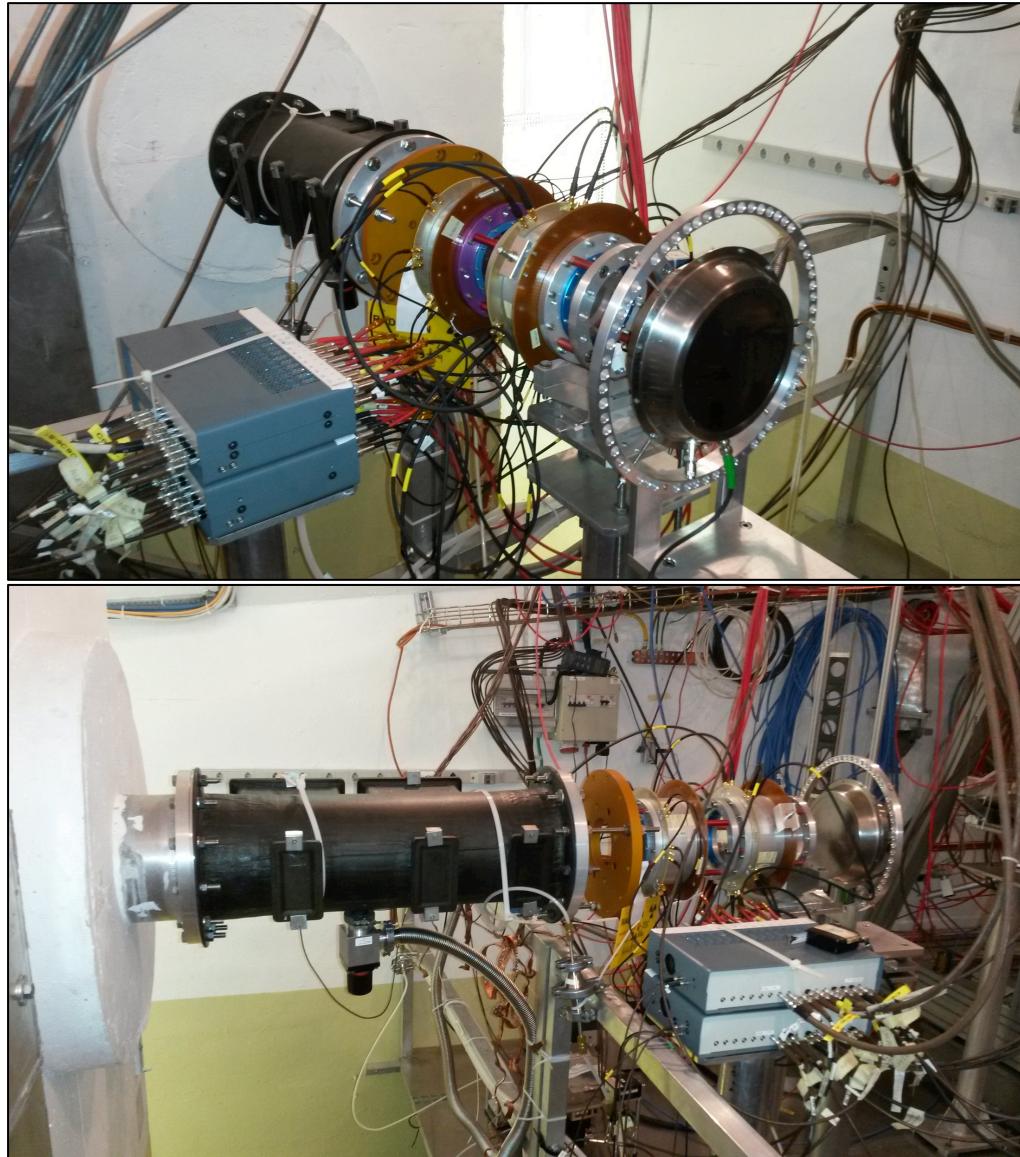


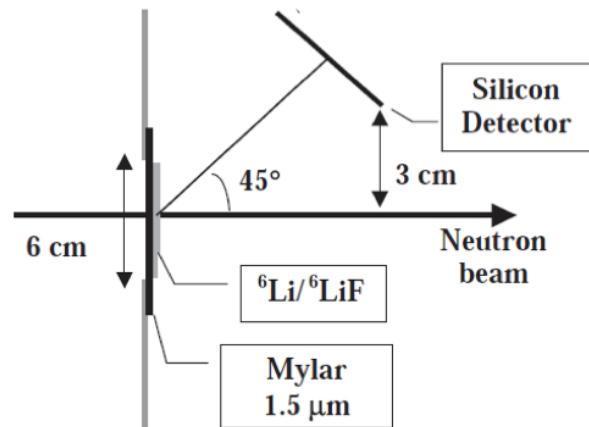
EAR2 capture detectors



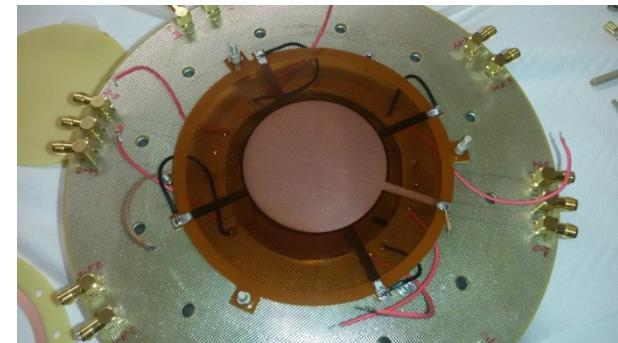
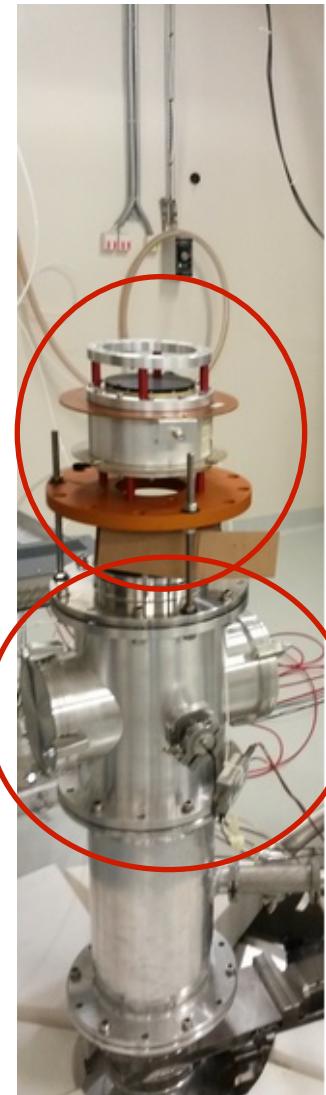
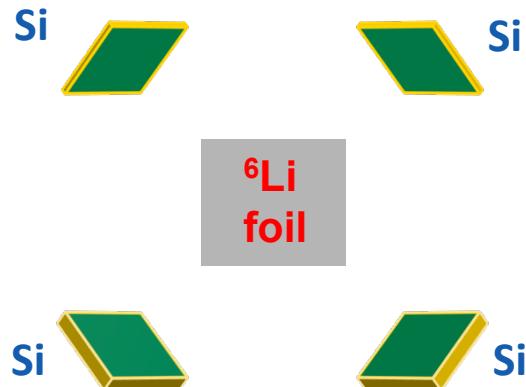




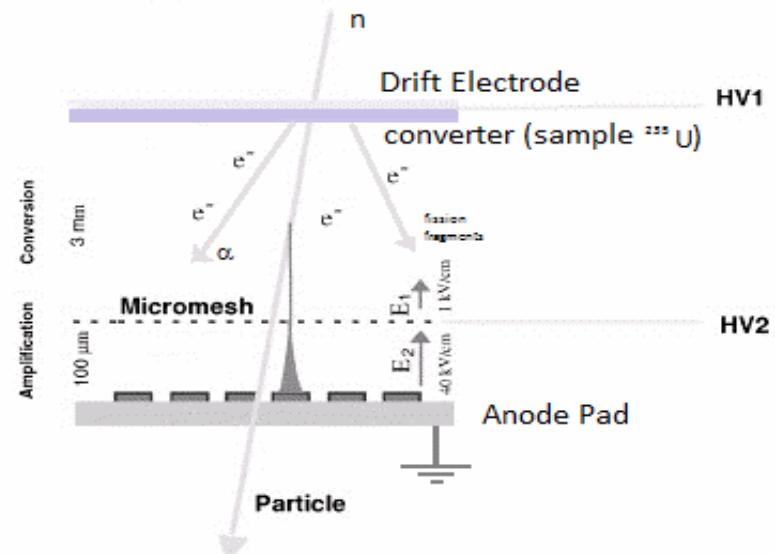




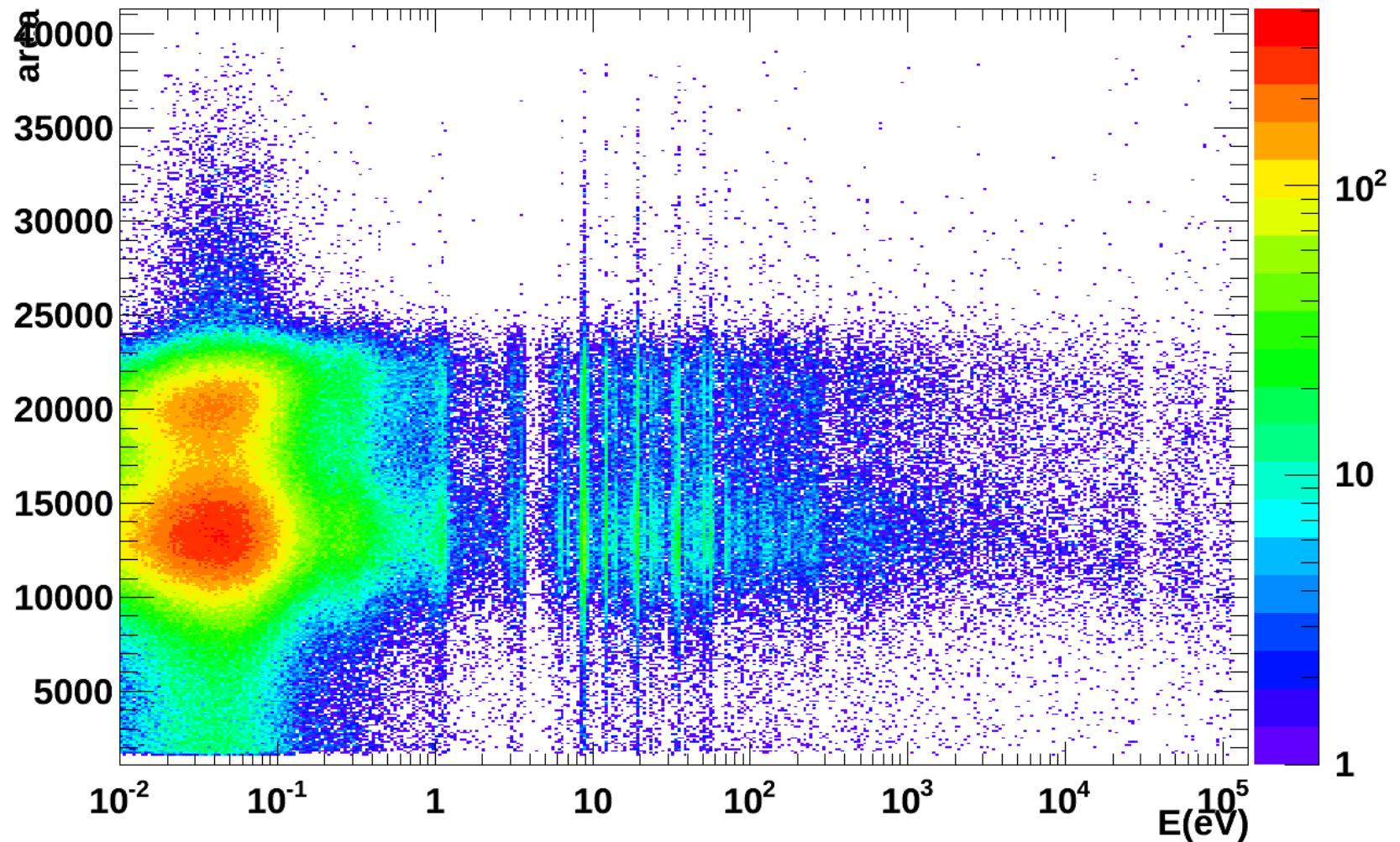
SIMON2



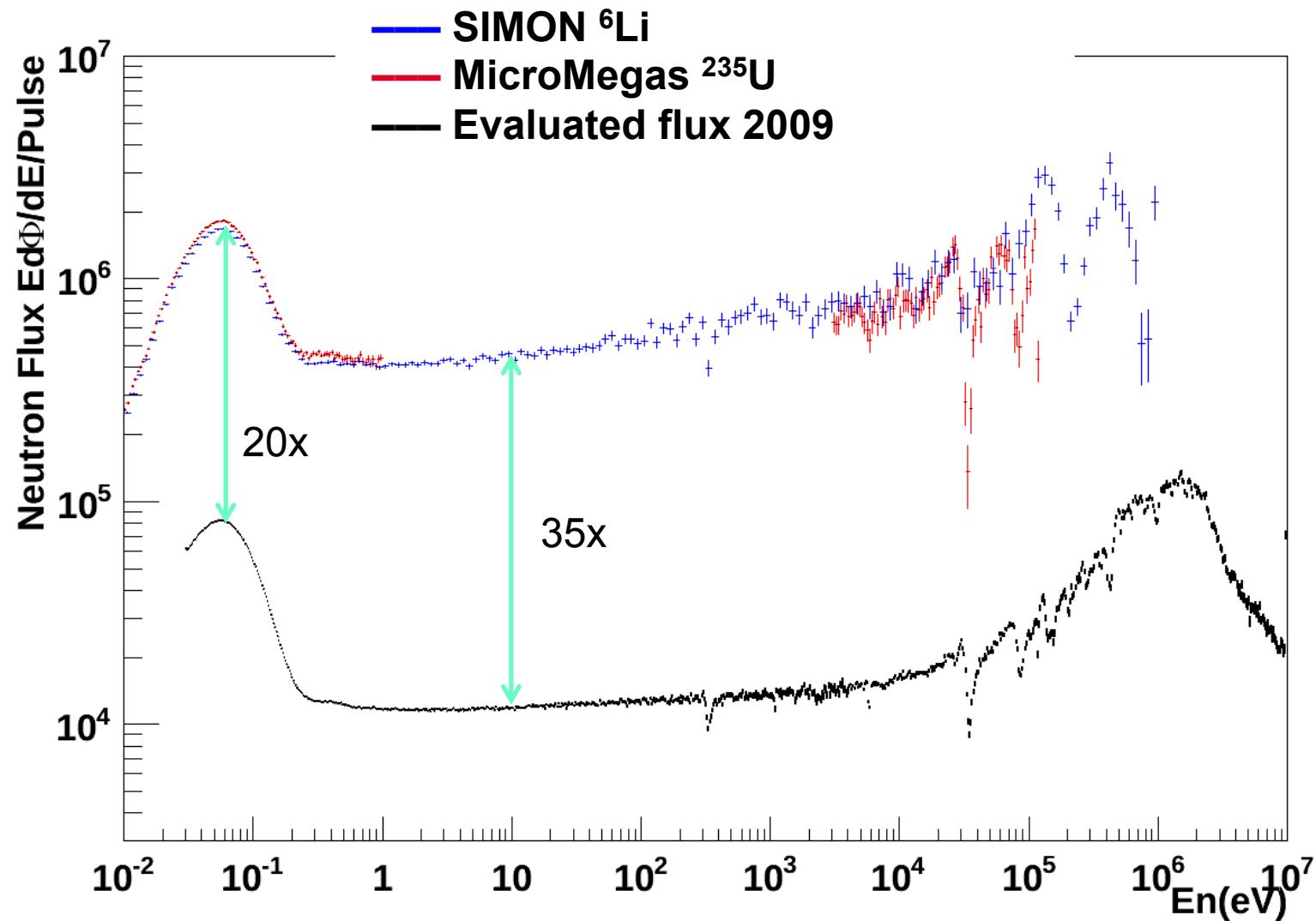
MICROMEGAS

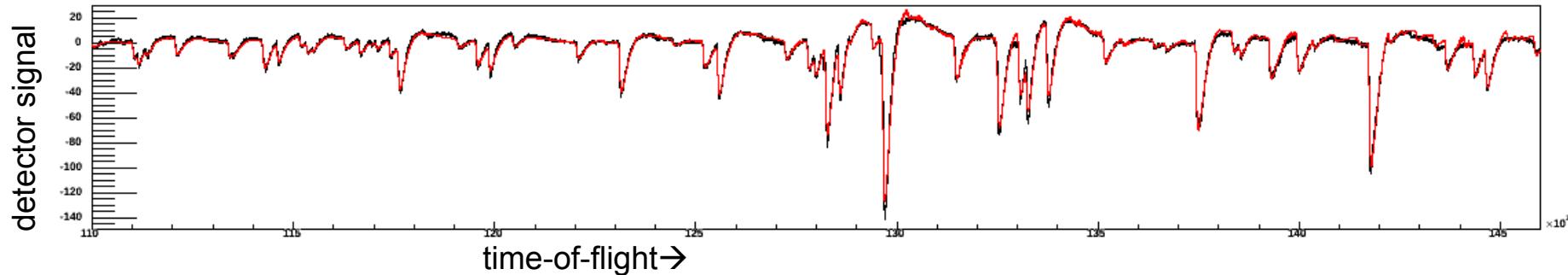


MESH-235U : area vs E



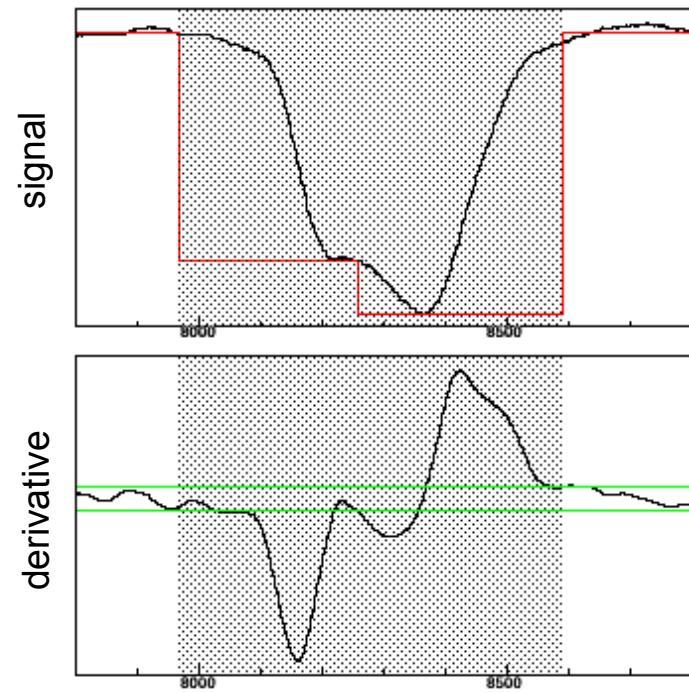
n_TOF EAR2 neutron flux





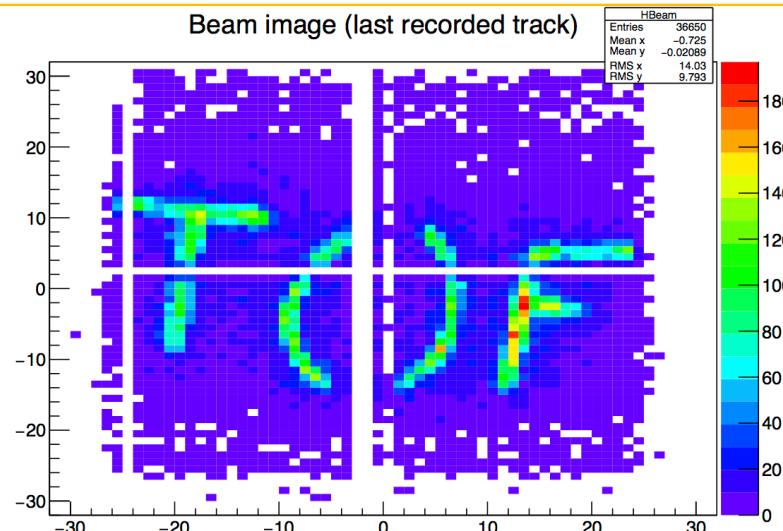
Analyze waveforms:

- peak recognition
- different detector types
- gamma-flash detection
- noise rejection
- pile-up rejection
- **pulse height analysis**
- **time extraction**



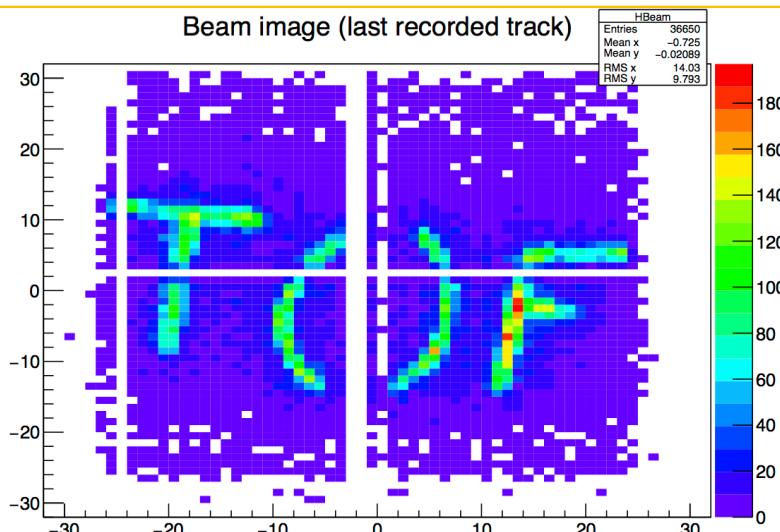
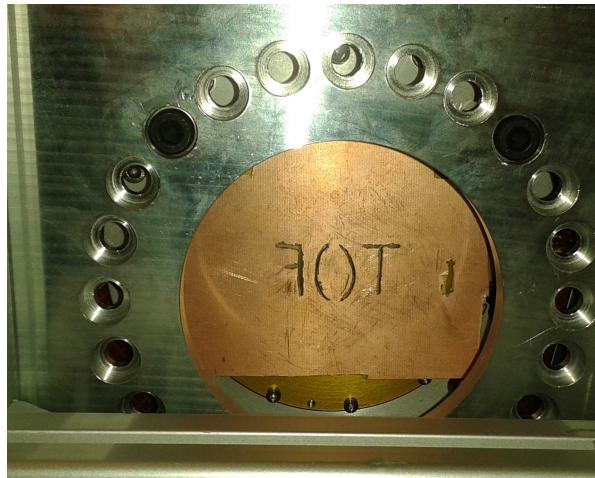
figs. P. Zugec

MicroMegas neutron beam profiler

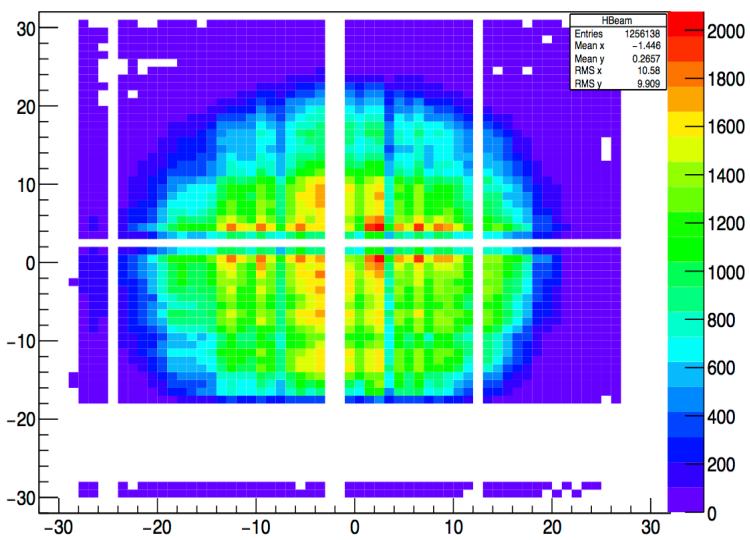


MicroBulk + GET electronics, laboratory setup: image X-rays

MicroMegas neutron beam profiler



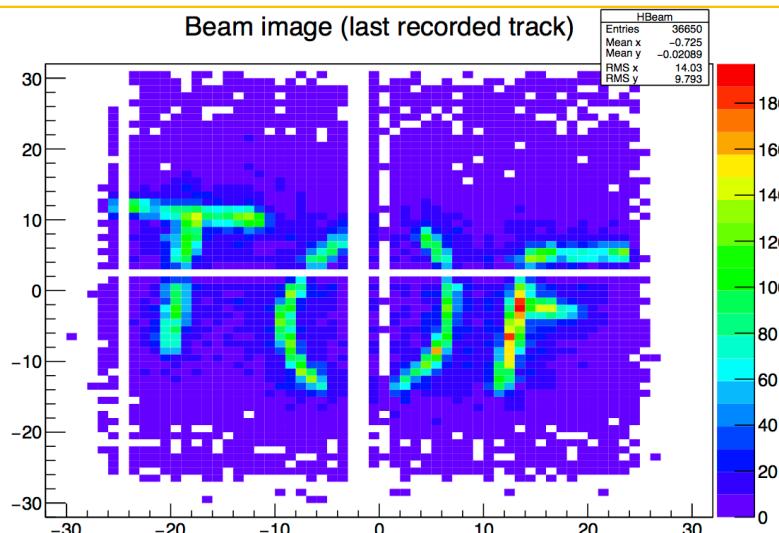
MicroBulk + GET electronics, laboratory setup: image X-rays



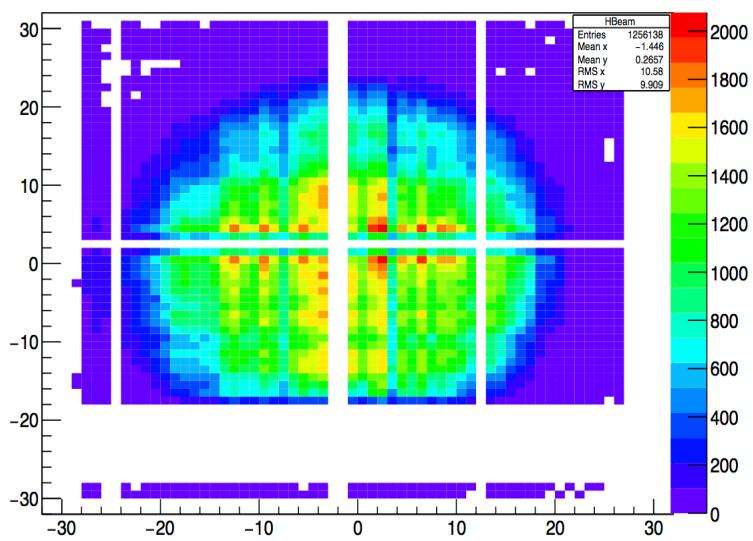
test GELINA



MicroMegas neutron beam profiler

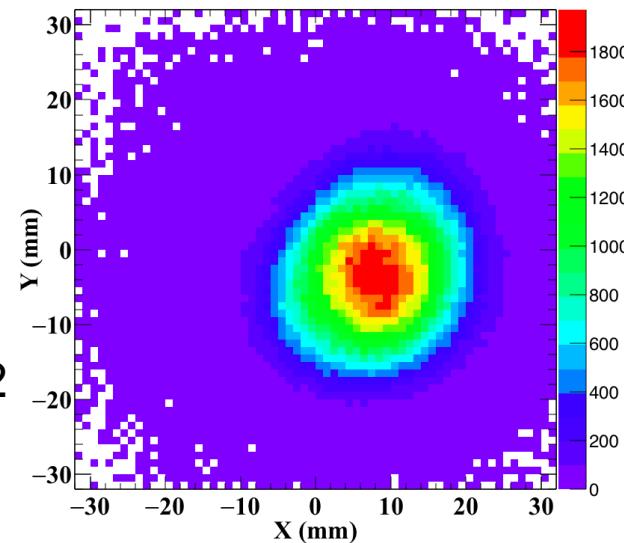


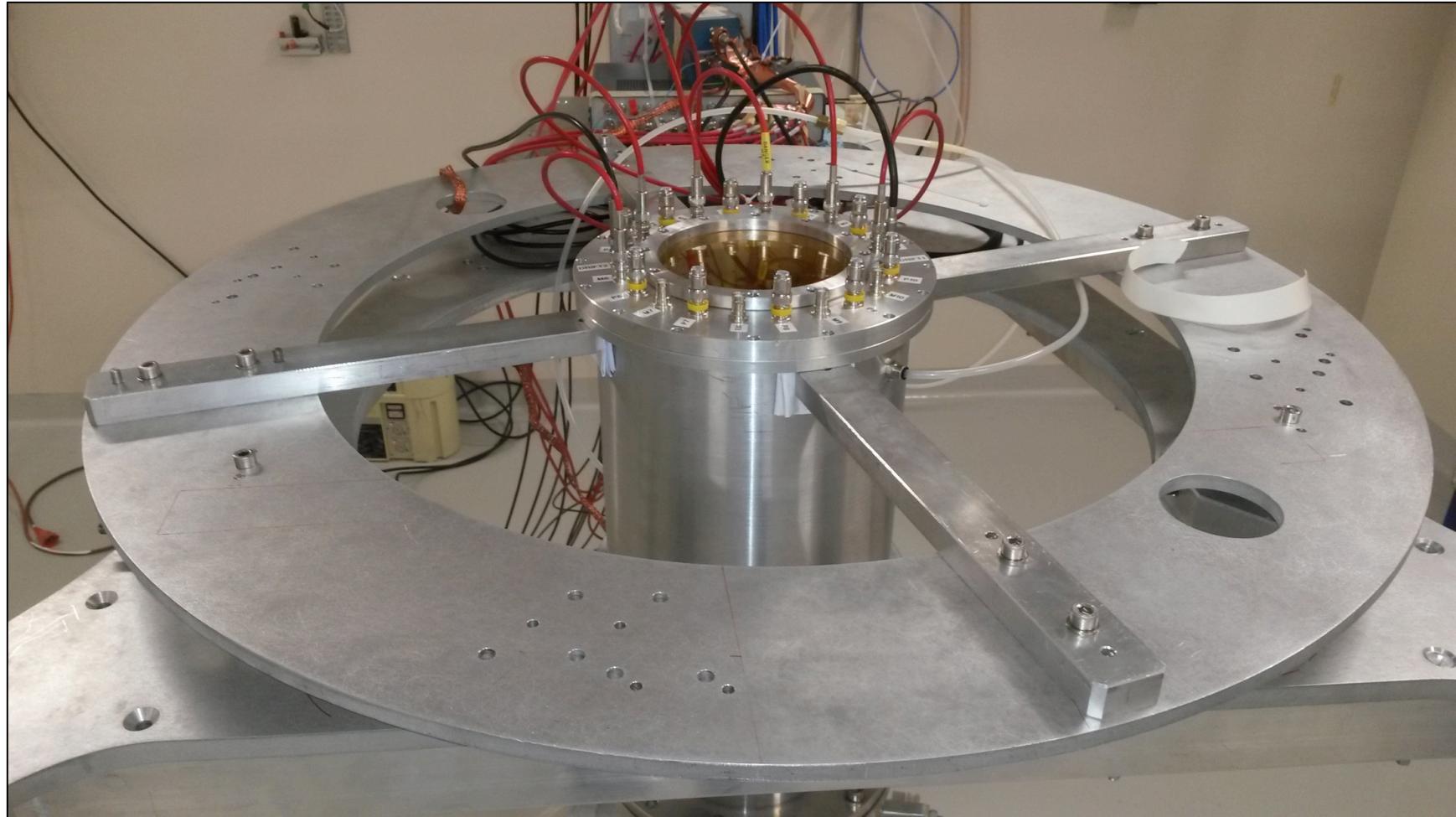
MicroBulk + GET electronics, laboratory setup: image X-rays

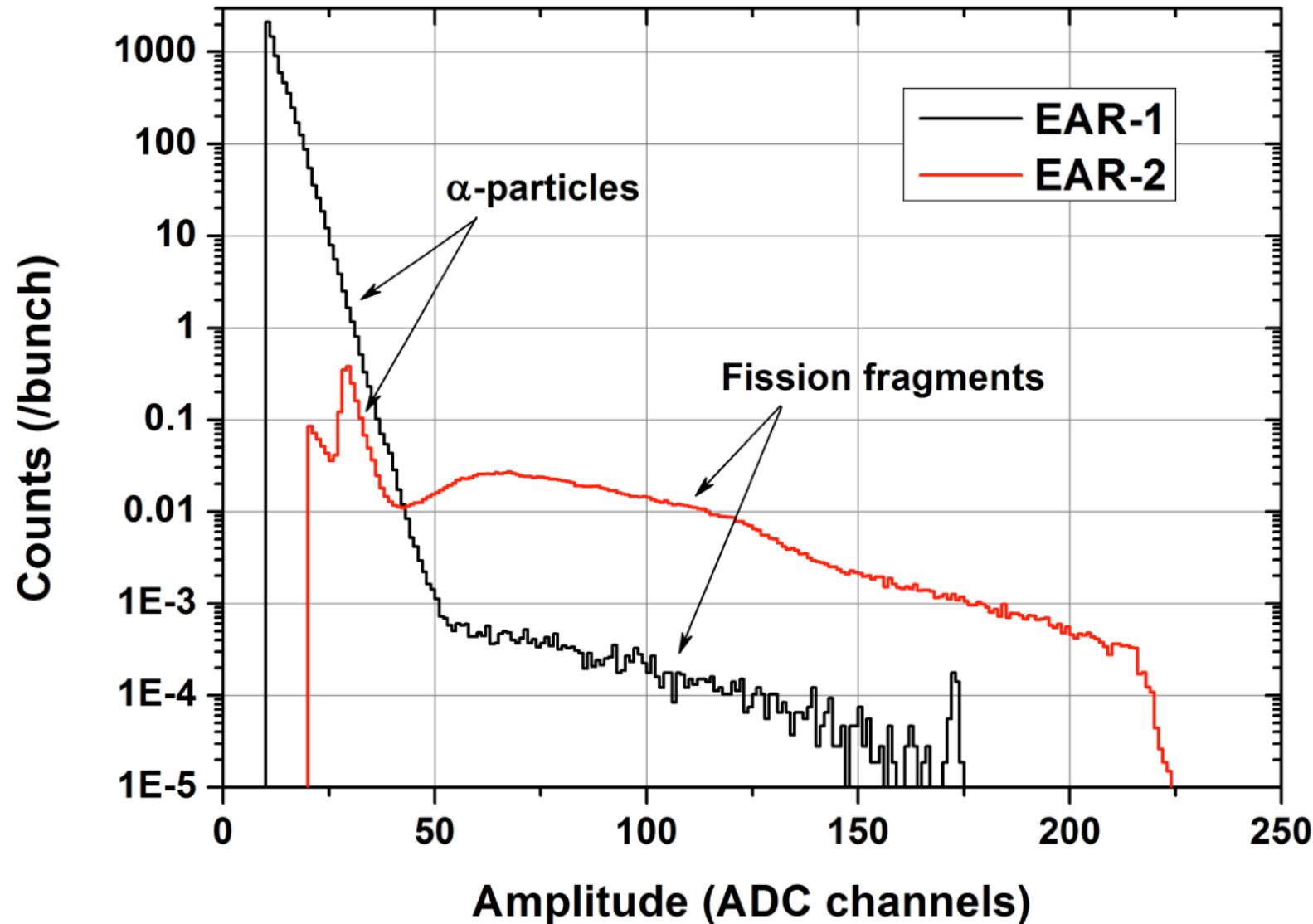


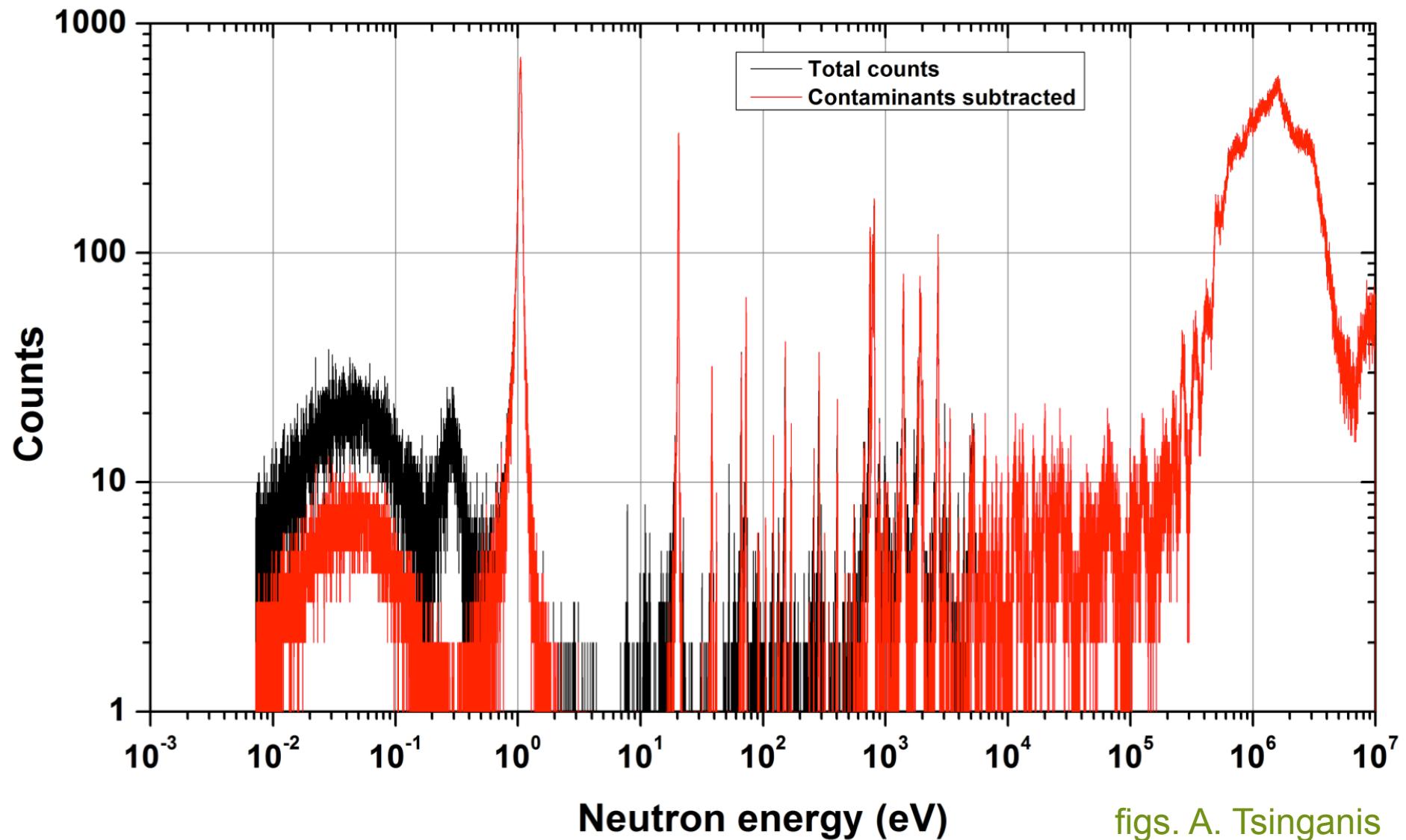
test GELINA
←

n_TOF EAR2
→









EAR1

2014

EAR2

commissioning

$^{73}\text{Ge}(n,\gamma)$

$^{171}\text{Tm}(n,\gamma)$

comm.

$^{240}\text{Pu}(n,f)$

EAR1

2014

EAR2

commissioning
 $^{70}\text{Ge}(n,\gamma)$

$^{203}\text{Tl}(n,\gamma)$
 ^{204}Tl dummy

$^{204}\text{Tl}(n,\gamma)$

$^{171}\text{Tm}(n,\gamma)$

$^{147}\text{Pm}(n,\gamma)$

$^{242}\text{Pu}(n,\gamma)$

$^{74}\text{Ge}(n,\gamma)$

$^{7\text{Be}}(n,\alpha)$

$^{16}\text{O}(n,\alpha)$

$^{33}\text{S}(n,\alpha)$

$^{237}\text{Np}(n,f)$ PPAC

$^{240}\text{Pu}(n,f)$

STEFF1

commissioning

$^{73}\text{Ge}(n,\gamma)$

$^{171}\text{Tm}(n,\gamma)$

$^{237}\text{Np}(n,f)$ PPAC

$^{240}\text{Pu}(n,f)$

Thank you for your attention.

