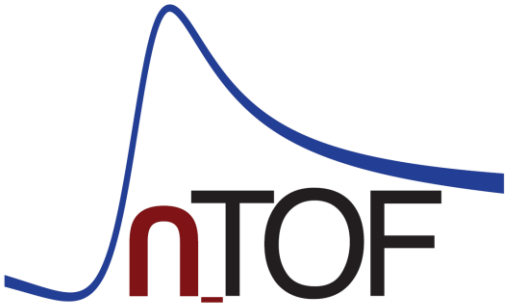


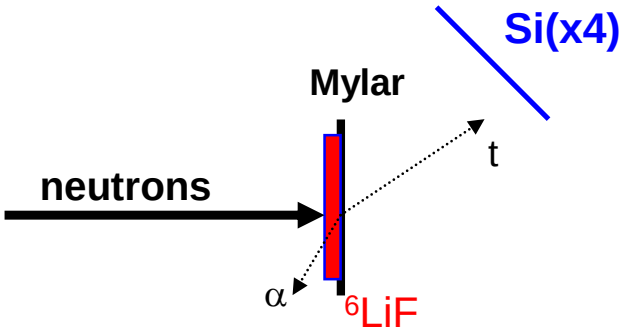
Status of SiMon and SiMon2

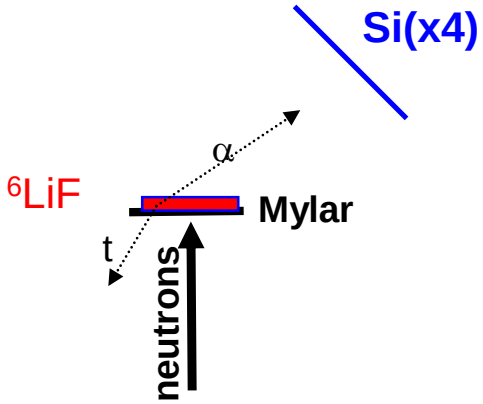
Summary

- Hands on
- Status of SiMon and recommended improvements
- Status of SiMon2 and recommended improvements
- Material inventory

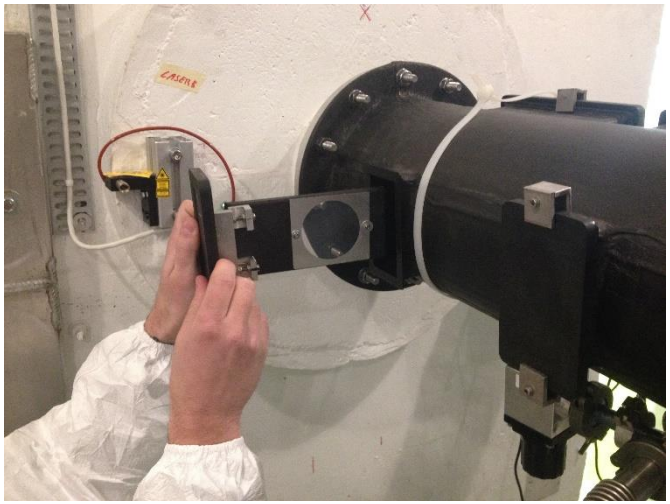
SiMon/SiMon2

Transparent neutron **flux monitor**, only the converter is in the beam.
Neutron **flux measurement**.



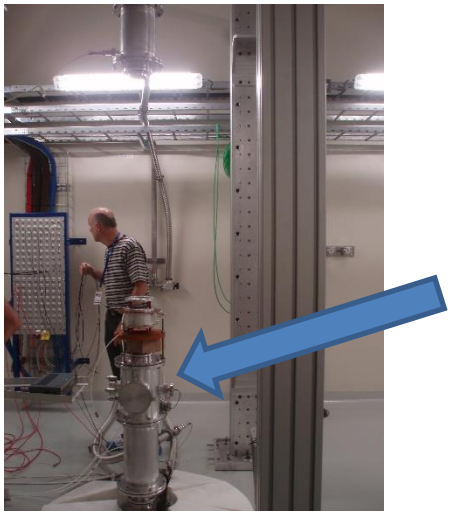


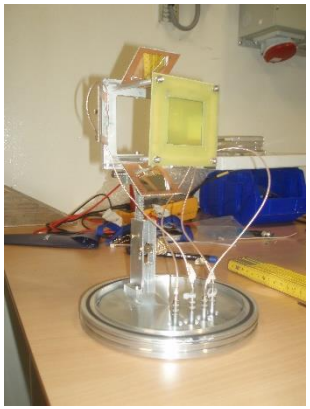
LiF 600 μgr/cm^2 on mylar backing, 6x4 cm^2 silicons



S. Marrone et al., Nucl. Inst. Meth. A 517 (2004) 389–398

LiF 105 μgr/cm^2 on mylar backing, 3x3 cm^2 silicons





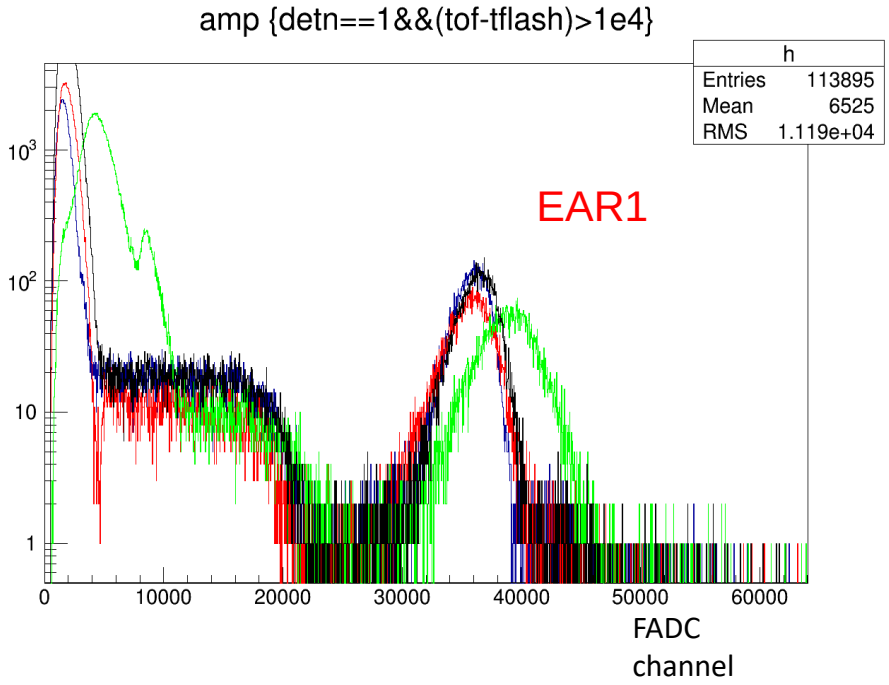
L. Cosentino et al., Rev. Sci. Instr. 86 (2015) 073509.

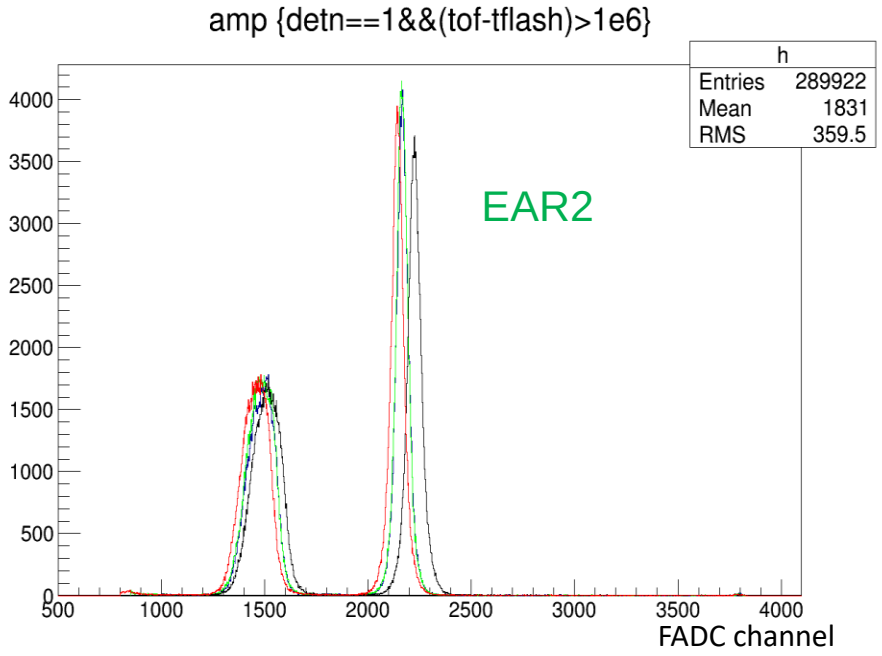
SiMon/SiMon2

Detector outputs go through commercial preamplifiers and amplifiers.

SiMon: EV 5194 preamplifier (20 mV/MeV) + Ortec 863 Quad TFA

SiMon2: NeTInstruments 32 ch (45mV/MeV) + Ortec 474 TFA





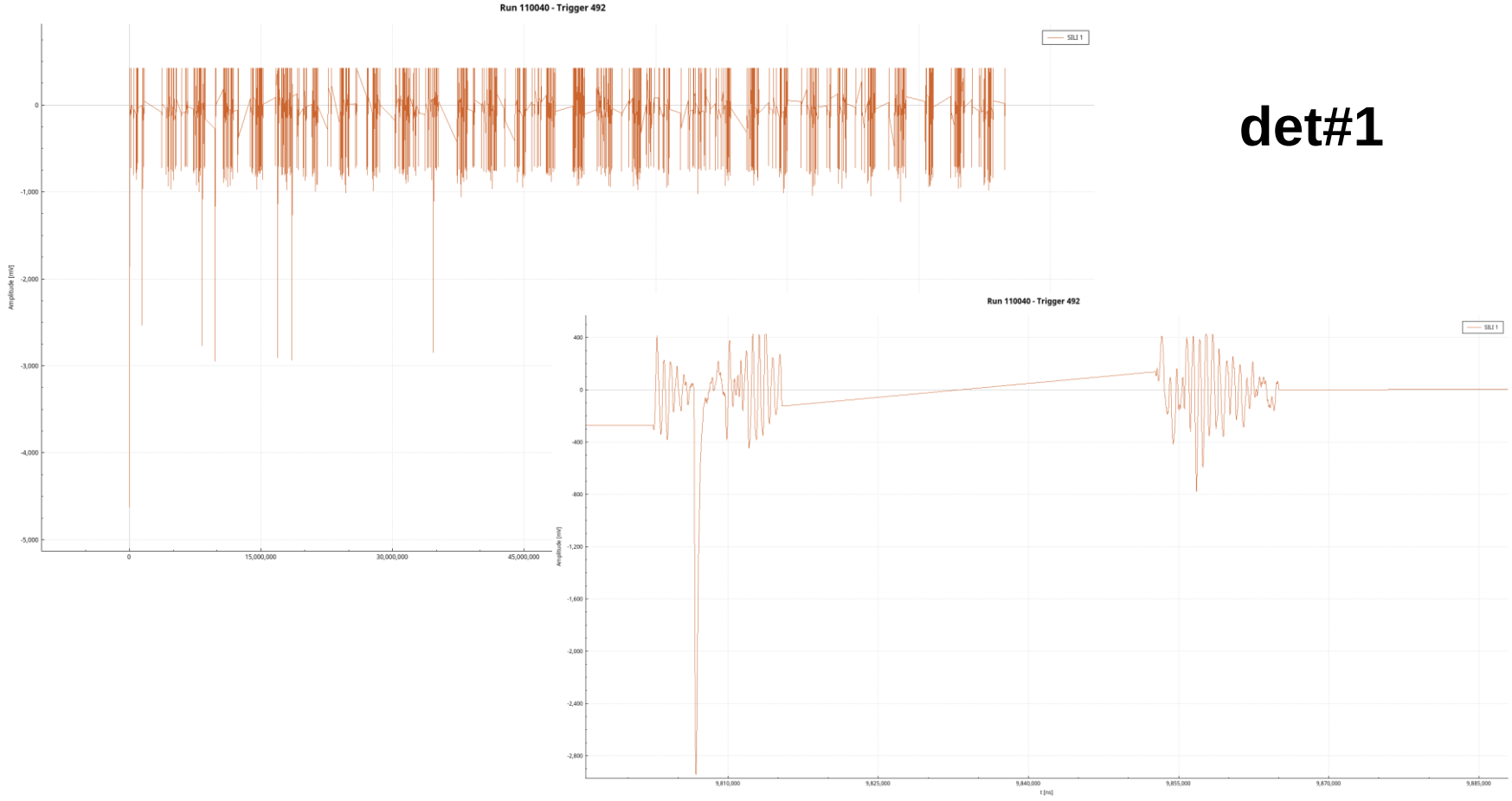
According also to users, generally speaking the detectors behaved well along the 5 years recent campaign, but surely there is room for **further** improvement.

SiMon

- Used successfully along n_TOF-Ph1, n_TOF-Ph2 and n_TOF-Ph3 (>20 years at the resume of operations post LS2)

SiMon

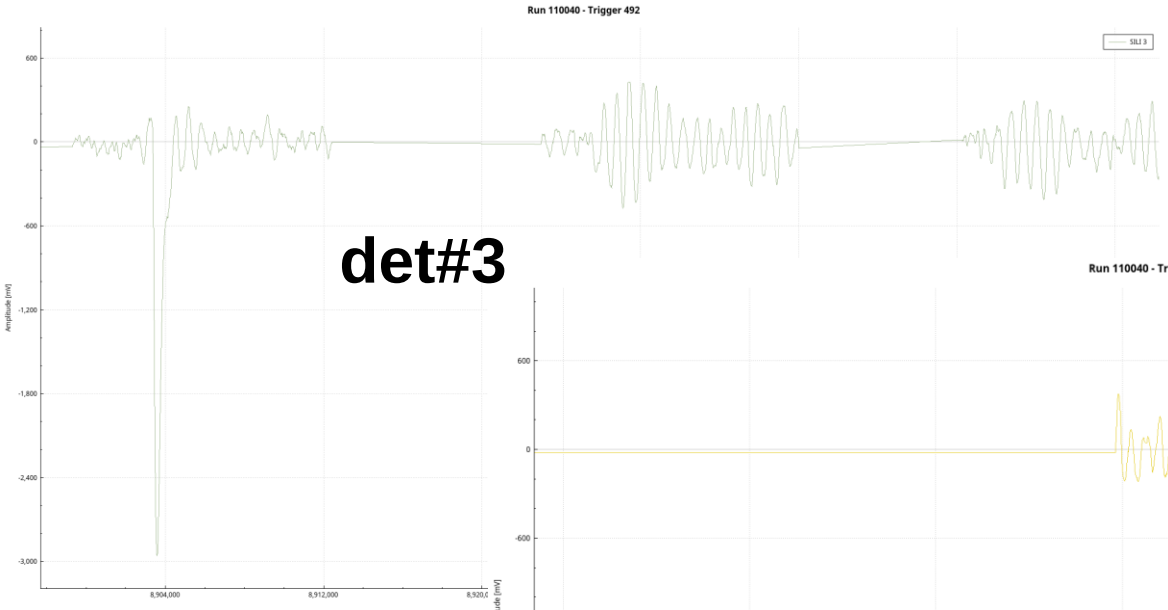
- Used successfully along n_TOF-Ph1, n_TOF-Ph2 and n_TOF-Ph3 (>20 years at the resume of operations post LS2)
- In general the performances of the detector were good but “noise-hunting” is always an issue (and got much worse along Ph3, **i.e. time consuming**)



det#1

SiMon

- Used successfully along n_TOF-Ph1, n_TOF-Ph2 and n_TOF-Ph3 (>20 years at the resume of operations post LS2)
- In general the performances of the detector were good but “noise-hunting” is always an issue (and got much worse along Ph3, **i.e. time consuming**)

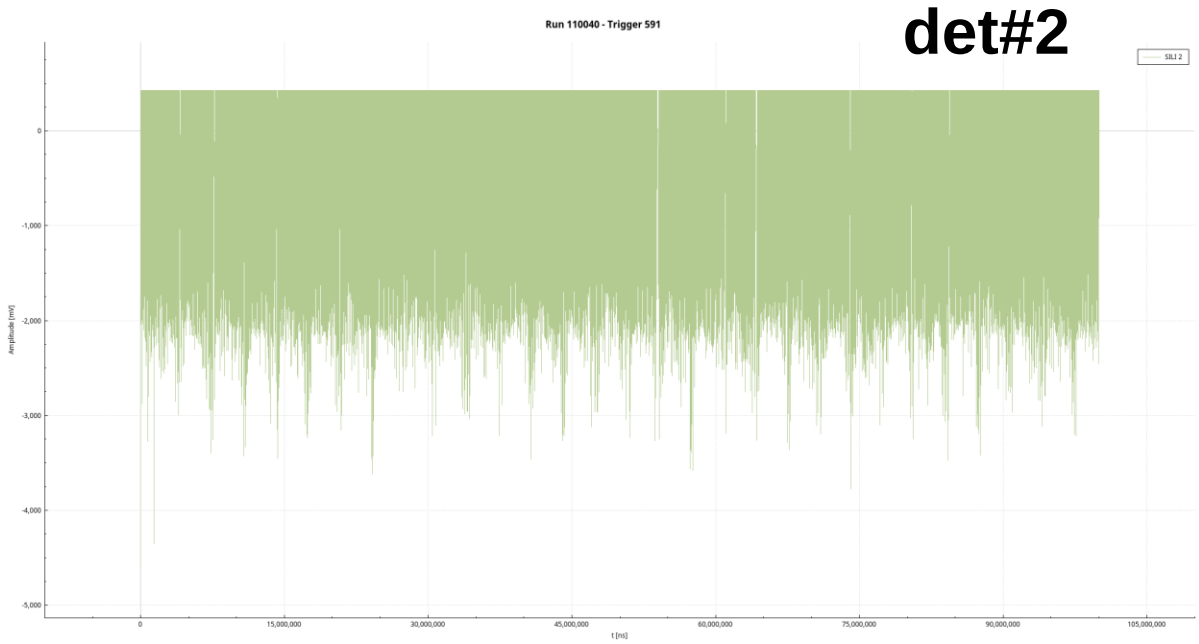


det#3

det#4

SiMon

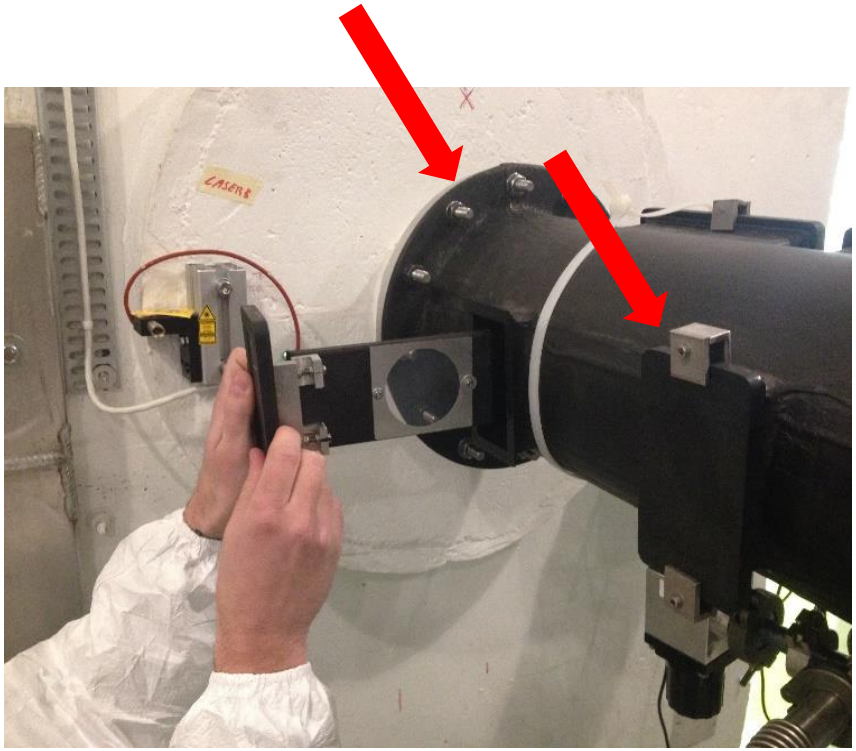
- Used successfully along n_TOF-Ph1, n_TOF-Ph2 and n_TOF-Ph3 (>20 years at the resume of operations post LS2)
- In general the performances of the detector were good but “noise-hunting” is always an issue (and got much worse along Ph3, **i.e. time consuming**)



At the very last experiment of Ph3 (^{12}C(n,p/d)), it was not possible to get detector #2 properly working:
- board?
- preamplifier?
- detector?

SiMon

- Used successfully along n_TOF-Ph1, n_TOF-Ph2 and n_TOF-Ph3 (>20 years at the resume of operations post LS2).
- In general the performances of the detector were good but “noise-hunting” is always an issue (and got much worse along Ph3, **i.e. time consuming**).
- Vacuum Chamber: leaking, always a problem to keep vacuum (and open the shutter to start physics measurement).
- Non standard flanges.



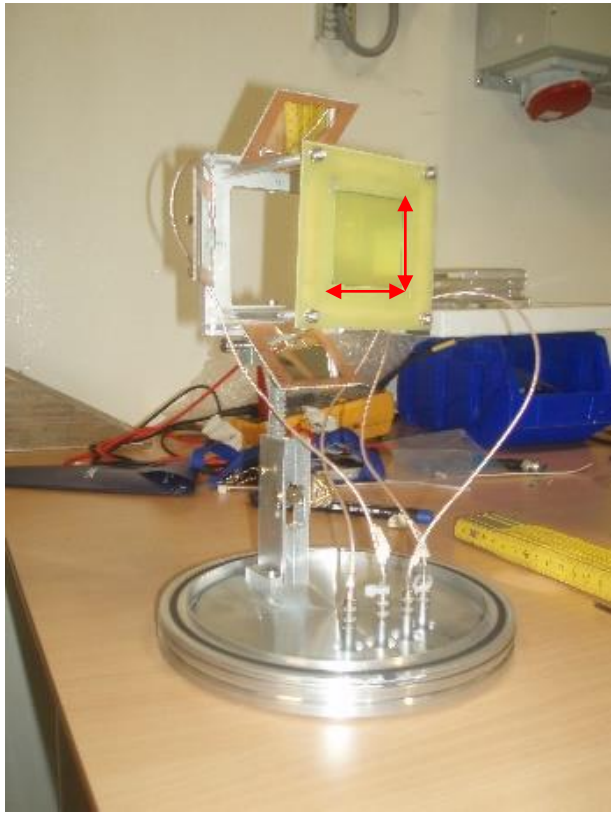
SiMon: recommended actions and improvements

- Investigate the problem with detector#2
- Test with α sources spare detectors
- Test new board (LNL) and spare preamplifiers (CERN)
- Different chamber at LNL?
- New LiF targets, to be prepared ''shortly'' before the resume of operations ~~(April 2021).~~

SiMon2: recommended actions and improvements

SiMon2: recommended actions and improvements

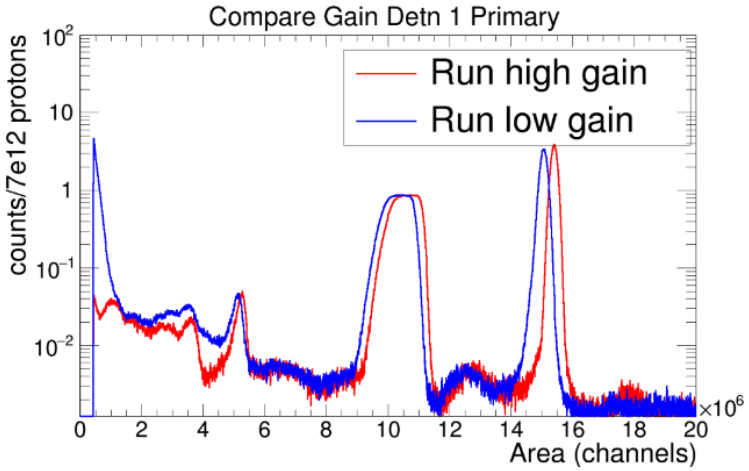
- Samples and related support bigger than 4.1x4.1 cm^2.
- Redesign mechanically part of the detector support, also in view of hosting **thinner samples (factor 3).**

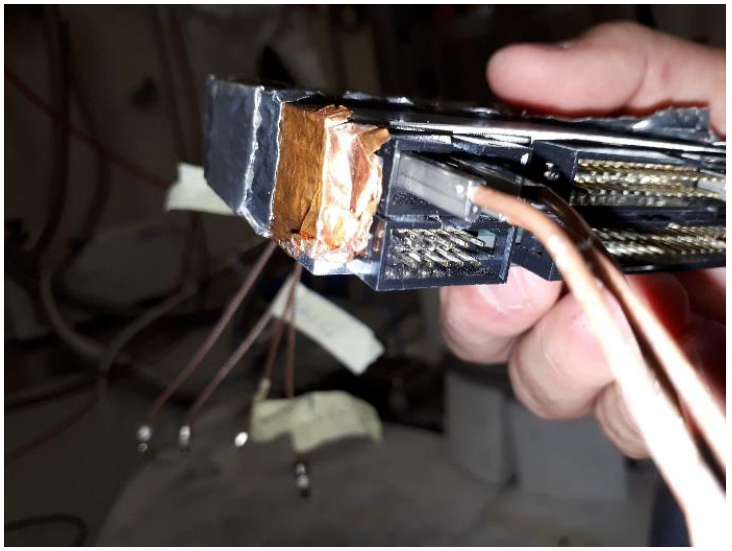


SiMon2: recommended actions and improvements

- Samples and related support bigger than 4.1x4.1 cm^2.
- Redesign mechanically part of the detector support, also in view of hosting **thinner samples (factor 3).**
- At the n_TOF meeting in Granada, it was reported a strange behaviour in signal output, in particular in amplitude gain.

- Stable monitor for 3 months
  - 105 μg/cm^2 ->Li^6
  - 4 silicon detectors 300μm





A better shielding of this preamplifier is strongly recommended.

Also, connect the preamplifier directly to the flange? (Allectra feedthrough on flange?)

Material Inventory

Detectors (those permanently installed are not included)

- 8 MSX 25-200 Micron
- 1 DSSSD 25-300 Micron
- 1 SSD 25-20 Micron
- 4 MSX09-300 Micron (SiMon2 spares)
- 3 Micron 6x4cm2, 300 mm (SiMon spares)

Modules

- 1 Bias Supplier Ortec 710
- 3/4 (not normally used, but useful) Ortec 474 amplifiers
- 1 Multichannel Low Voltage supplier (for Mesytec standard i.e.)
- 2 Mesytec preamplifiers lin-log (1 with differential output)
- 1 Mesytec preamplifier lin-lin
- 2 CAEN multichannel amplifiers and related controller

Chambers

- 3 Chambers “SiMon2 like”, one is leaking.

The end