CCE measurments with A12 detectors in Ljubljana

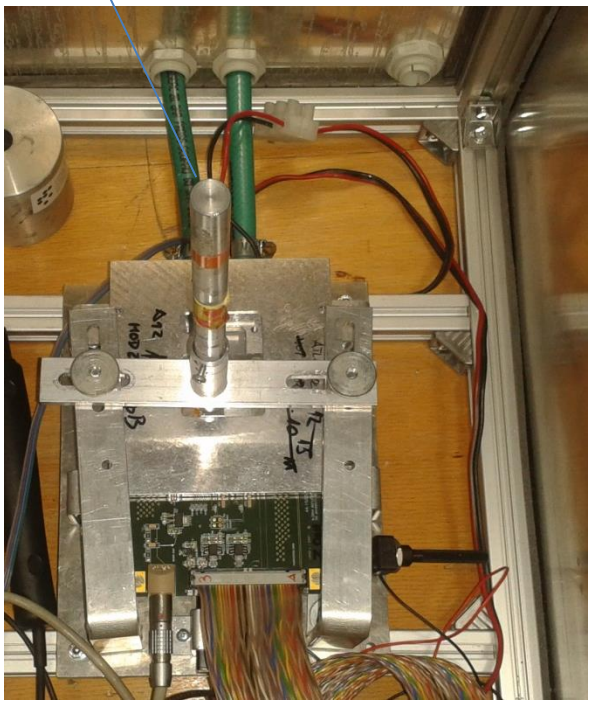
- Alibava readout system, Kazu.ini settings
- Keithley 2410 HV unit
- ^{90}Sr source
- only detector cooled with Peltier element, not the readout chip

- Detectors:

not irradiated:	w639-bz3c-p15
5e14 neutrons:	w631-bz3c-p12
1e15 neutrons:	w616-bz3c-p14
5e14 protons (B.):	w627-bz3c-p2
1e15 protons (B.):	w631-bz3c-p2

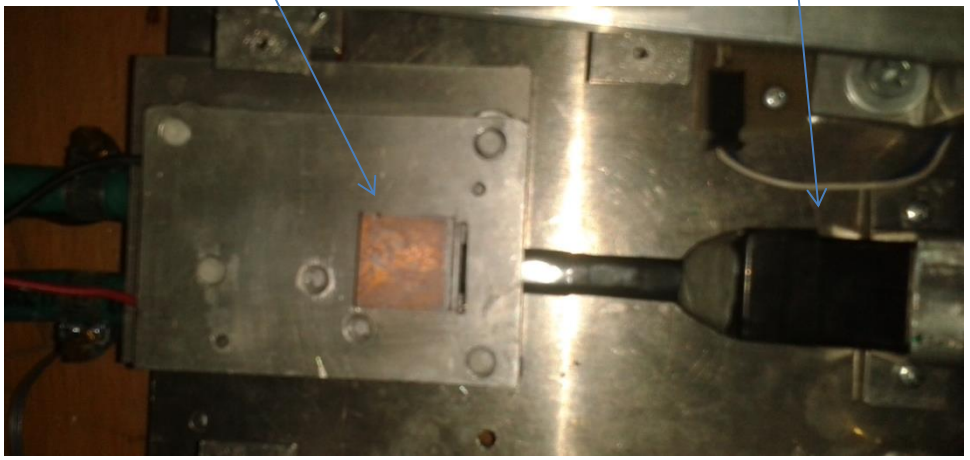
Setup

^{90}Sr source holder

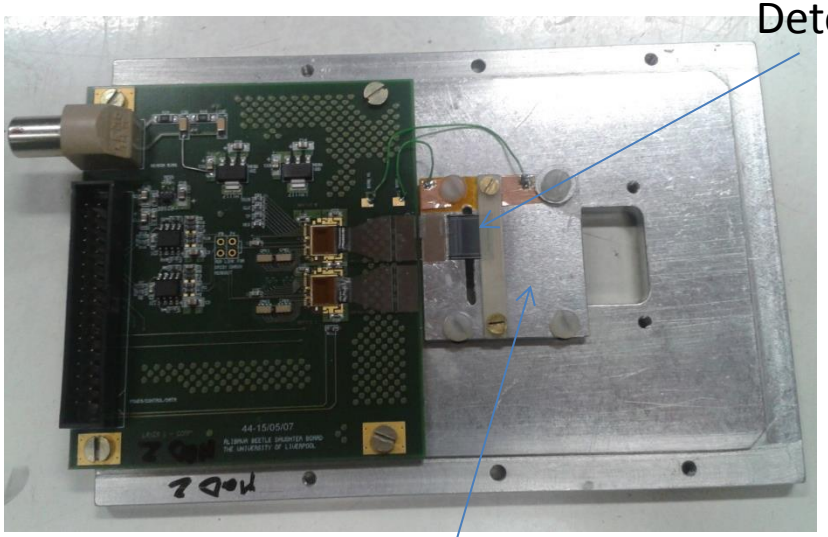


Cooling block

PM



Detector

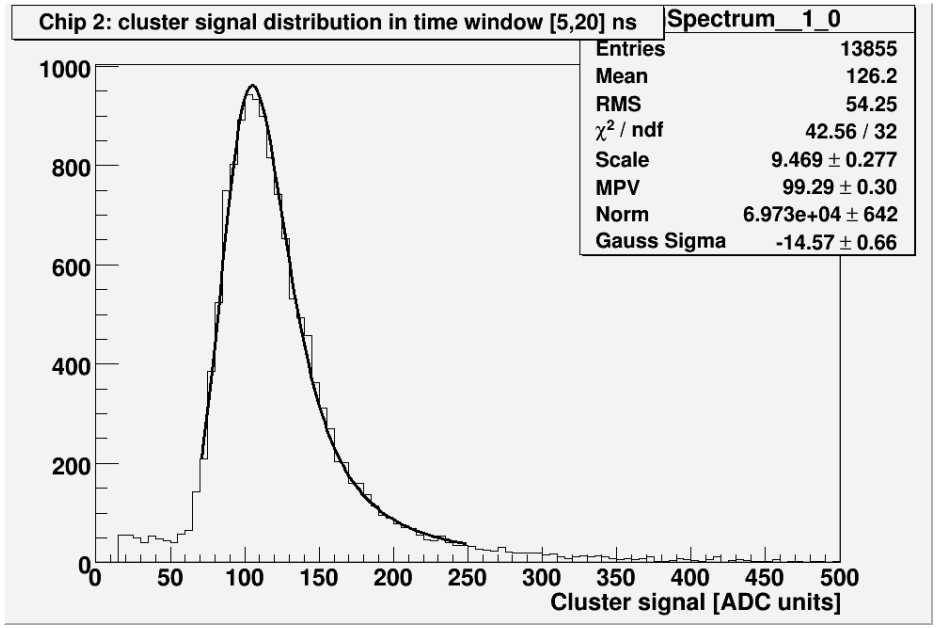


Al support in thermal contact with cooling block

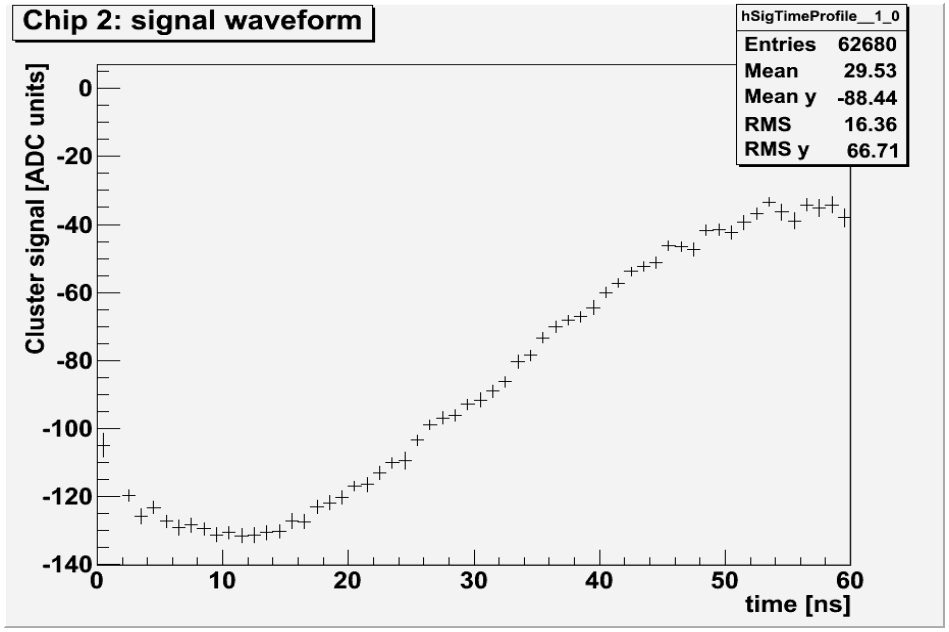
Not irradiated

Cuts:
- seed: 3.5
- neighbour: 1.8

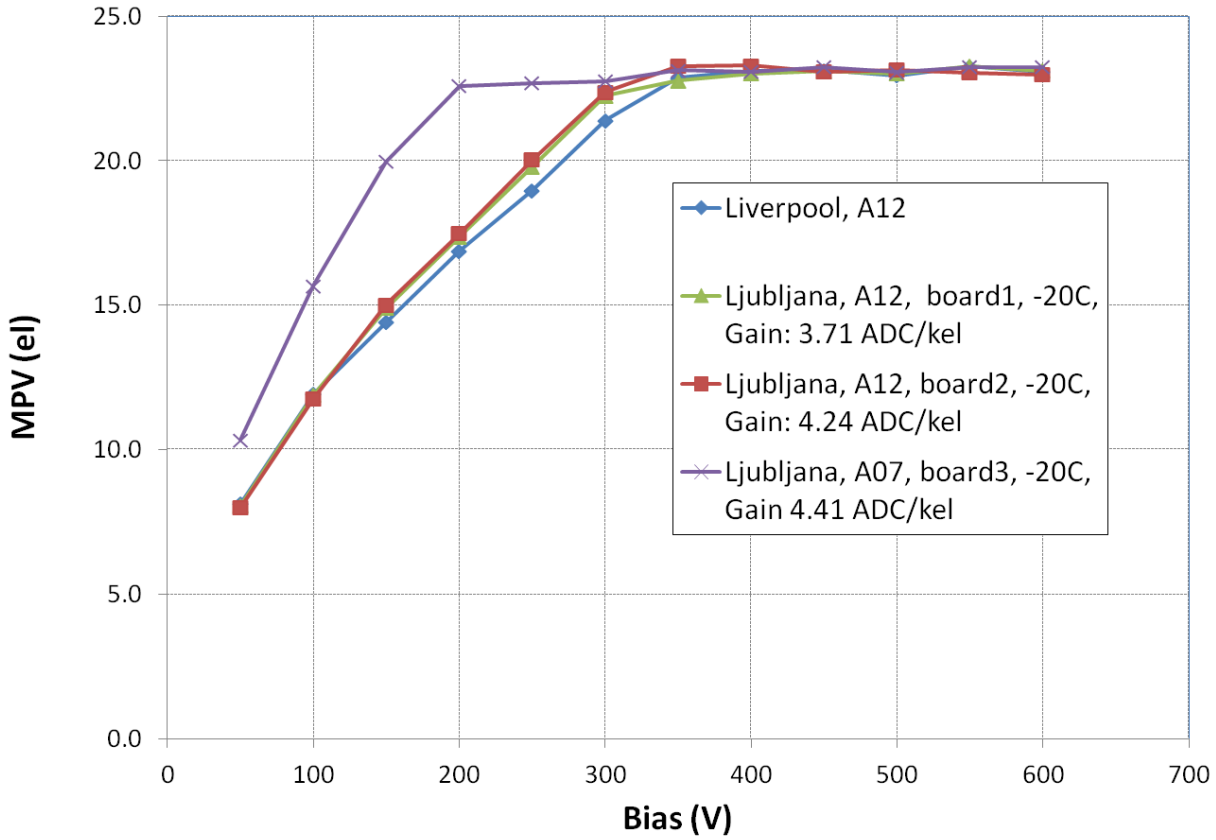
Fit:
- convolution of Gauss + Landau



Time distribution
- select events between 5 ns and 20 ns

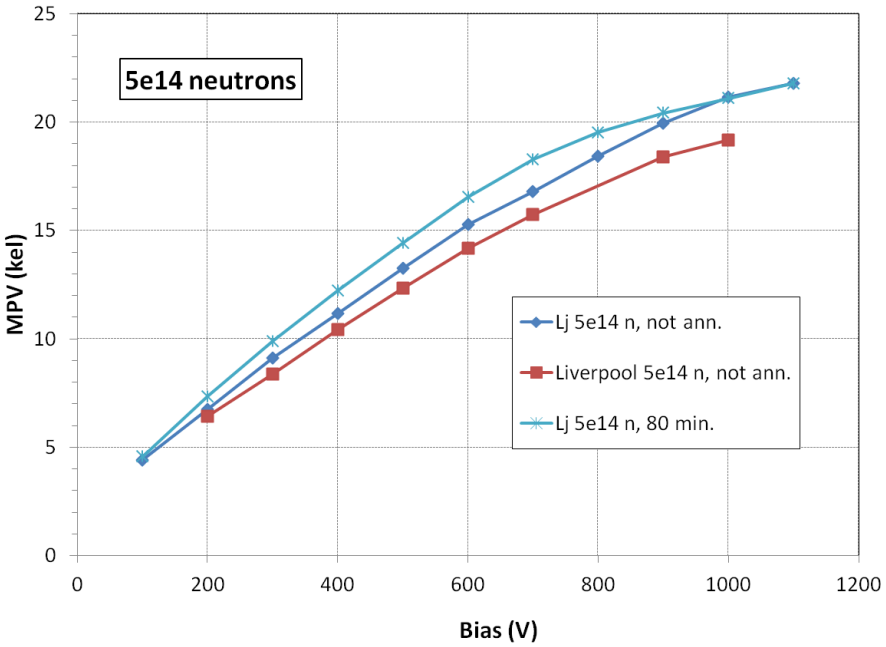


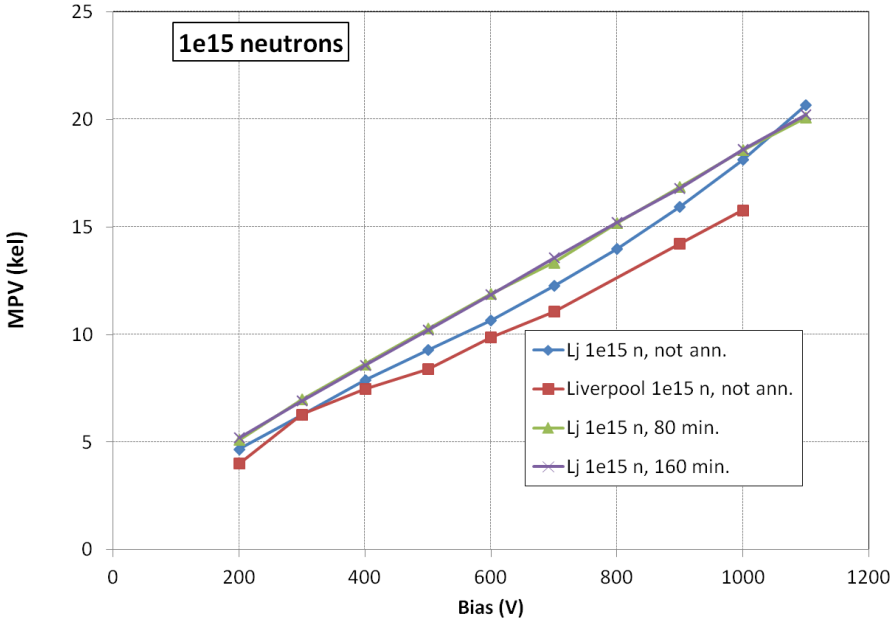
Not irradiated



- three daughter boards → different gains
- good agreement with Liverpool

Neutrons

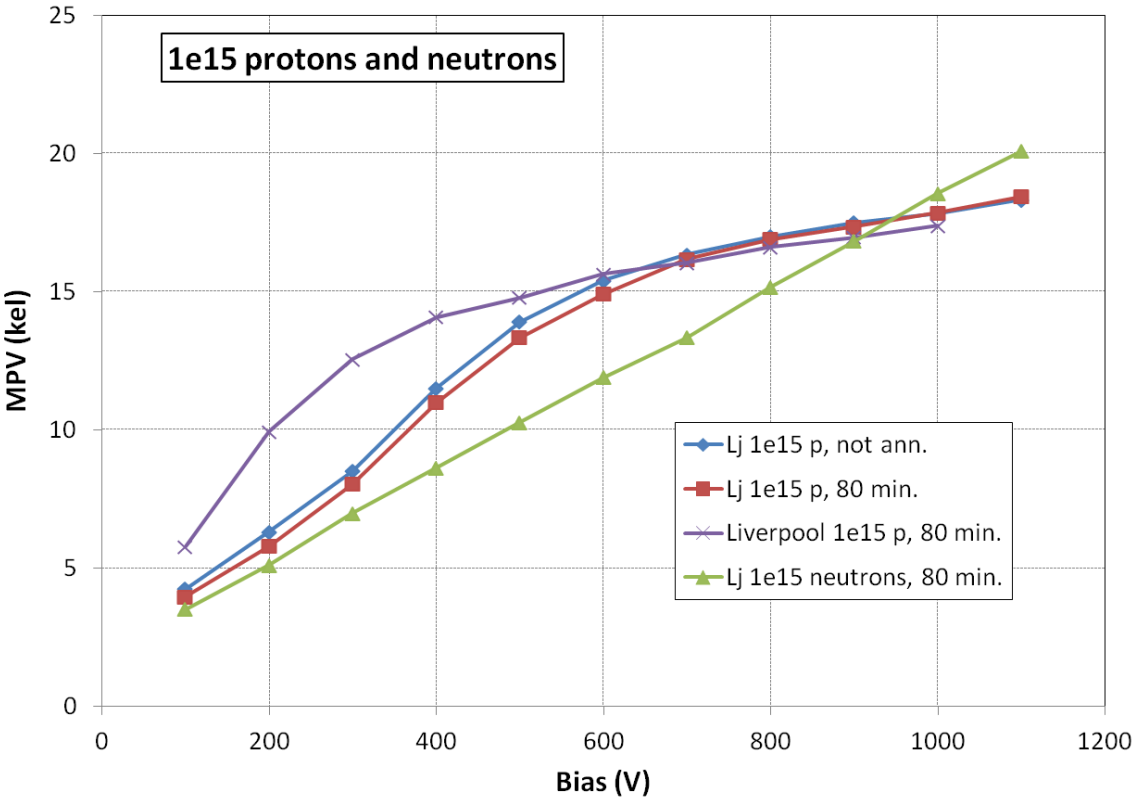




- before annealing Ljubljana slightly higher than Liverpool
- not much annealing
- no difference between 80 minutes and 160 minutes at 60°C for 1e15

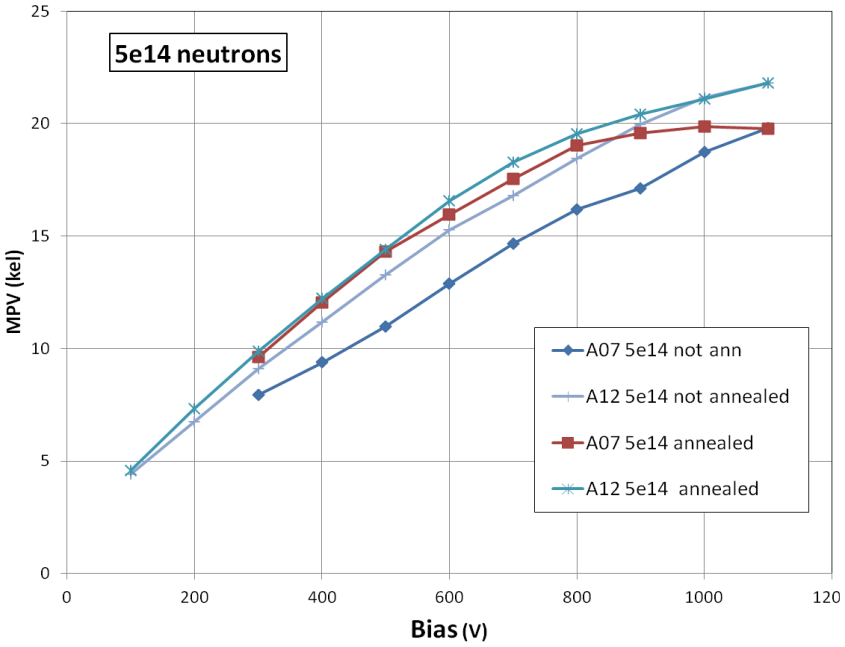
Protons (Birmingham)

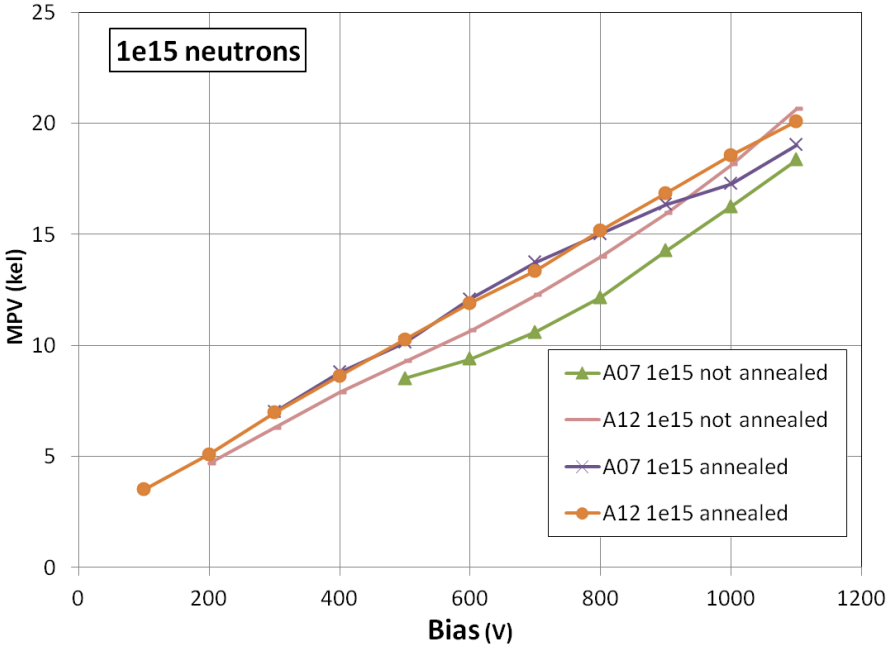
➔ detector irradiated to 5e14: very low charge (~ 3000 kel at 1000 V)



- almost no annealing
- at lower voltages very different from Liverpool
- at lower voltages different than after neutron irradiation

Comparison with A07





- A07 detectors measured with SCT128 setup

➔ good agreement after annealing

Summary

- A12 detectors irradiated to 5e14 and 1e15 with neutrons and Birmingham protons

- measurements before controlled annealing and after 80 minutes at 60°C

- neutrons:
  → CCE increases max 10% after 80 minutes annealing ➔ less than A07 detectors
  → after annealing collected charge as in A07 detectors

- protons:
  → detector irradiated to 5e14 doesn't work normally ➔ charge too low: only about ~ 3 kel
  → detector irradiated to 1e15: 80 minutes annealing has no effect
  → charge vs. bias curve different than after neutron irradiation
  ➔ at lower voltages more charge after proton irradiation

Future work:

- measure detectors irradiated to 2e15 and 5e15 with neutrons
- measure detectors irradiated to 2e15 and 5e15 with 70 MeV protons at CYRIC