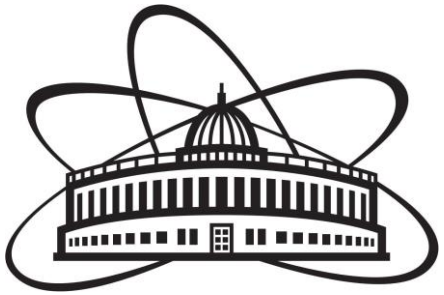
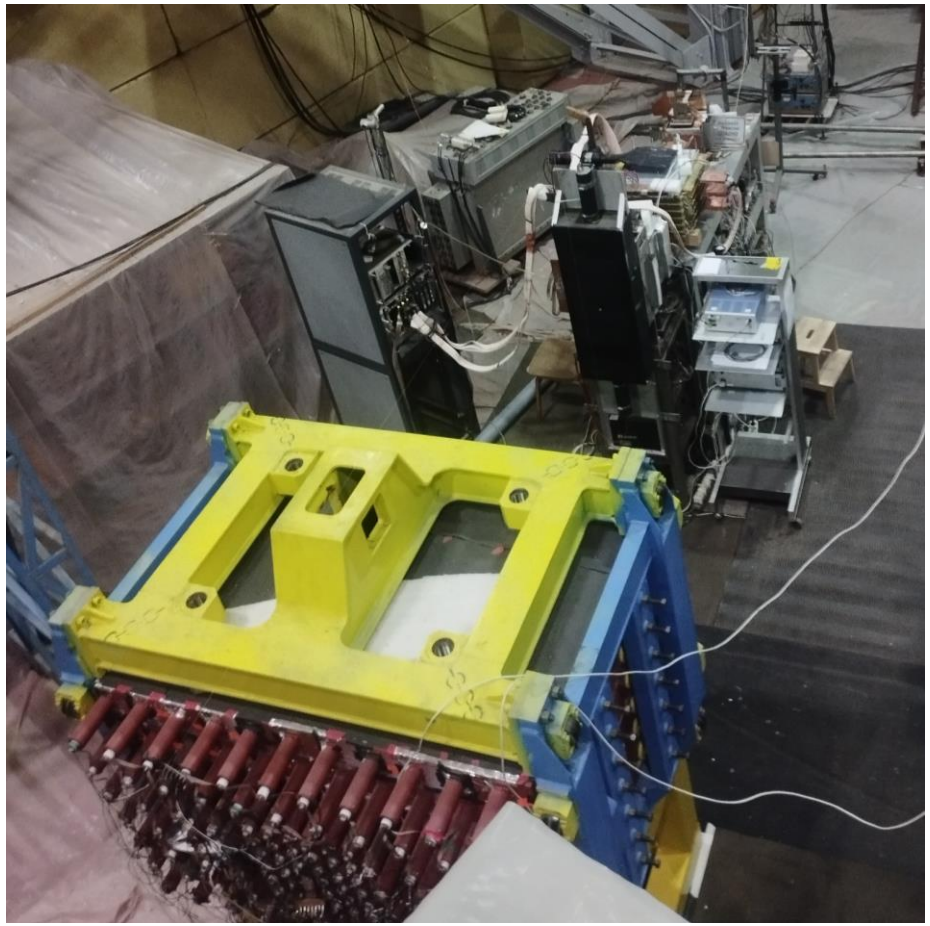


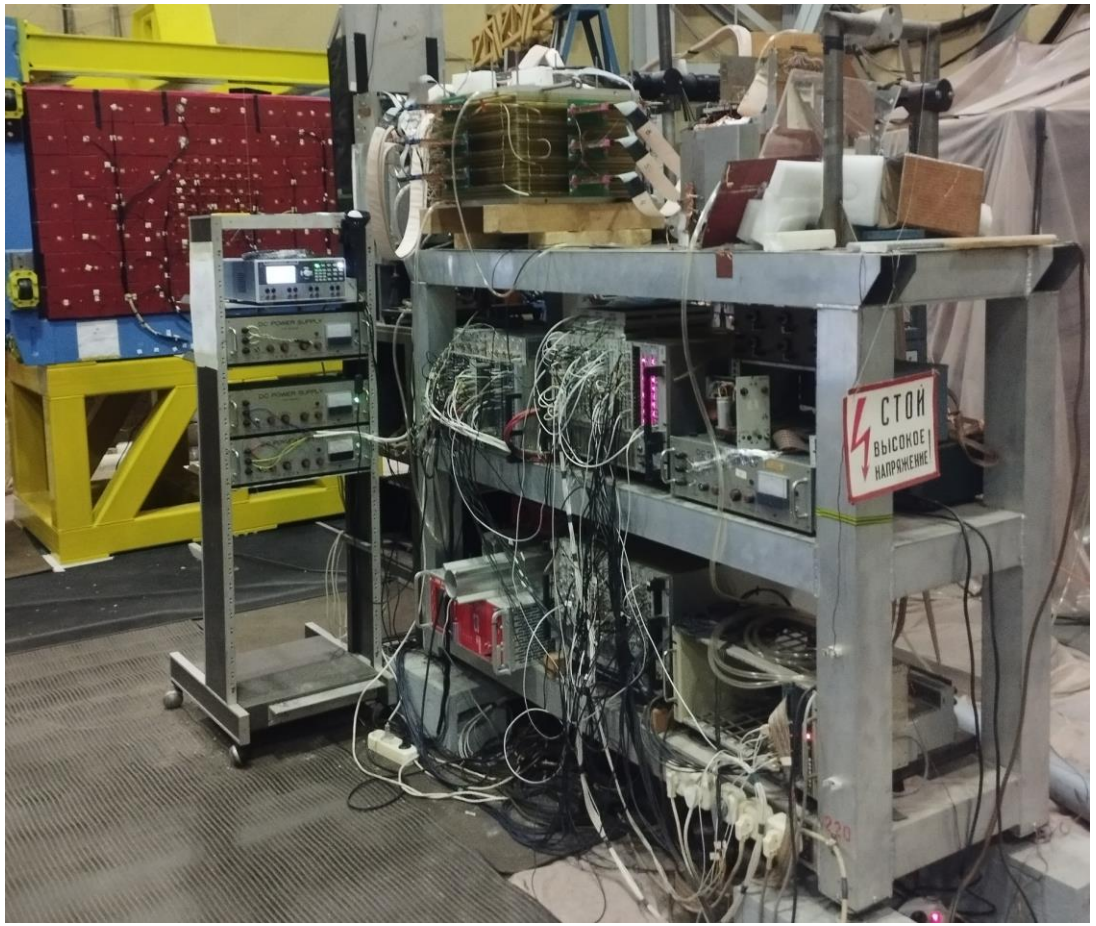
The XXVth International Baldin Seminar on High Energy Physics Problems "Relativistic Nuclear Physics and Quantum Chromodynamics, September 18 – 23, 2023, Dubna

New drift chambers for ALPOM-2 experiment.

Anton Druzhinin, Roman Shindin, Nikolay Piskunov, Yuri Kiryushin, Dmirty Kirillov, Natalia Kostiaeva, Evgeny Makoveev, Alexey Baskakov

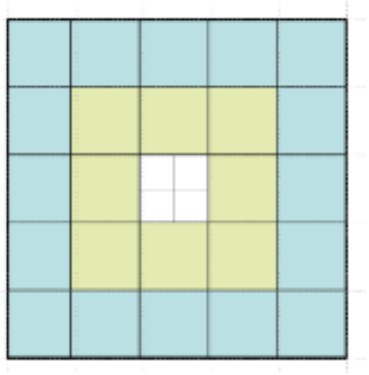
Alpom-2





Upgrading the ALPOM2 setup

Instead of the ALPOM2 hadron calorimeter (Fig.12), it is planned to use the ZDC of the BM@N setup (Fig. 13) in order to increase acceptance of detecting scattering particles and improve angle resolution at small angles.



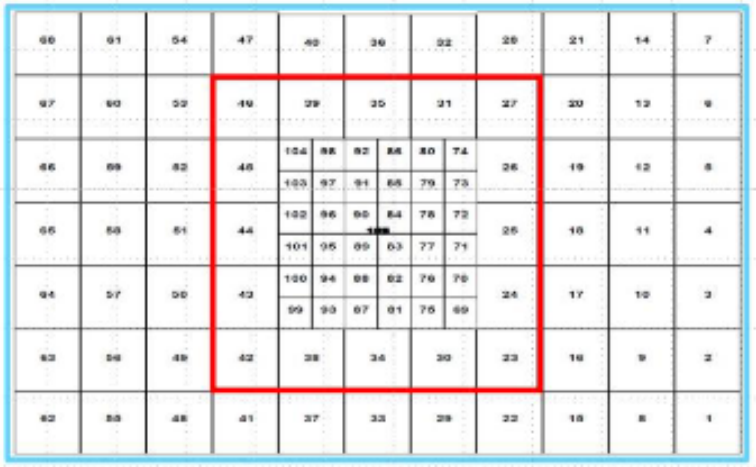
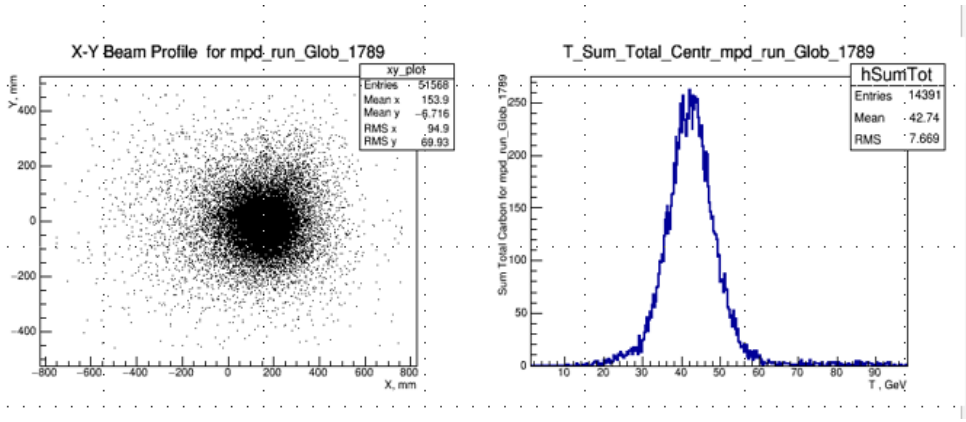


Fig. 12. ALPOM2 calorimeter layout: central part consist of 4 modules with sizes 7.5×7.5 cm^2, peripheral part contains 24 modules of 15×15 cm^2

Fig. 13. ZDC layout: central part consist of 36 modules with sizes 7.5×7.5 cm^2, peripheral part contains 68 modules of 15×15 cm^2

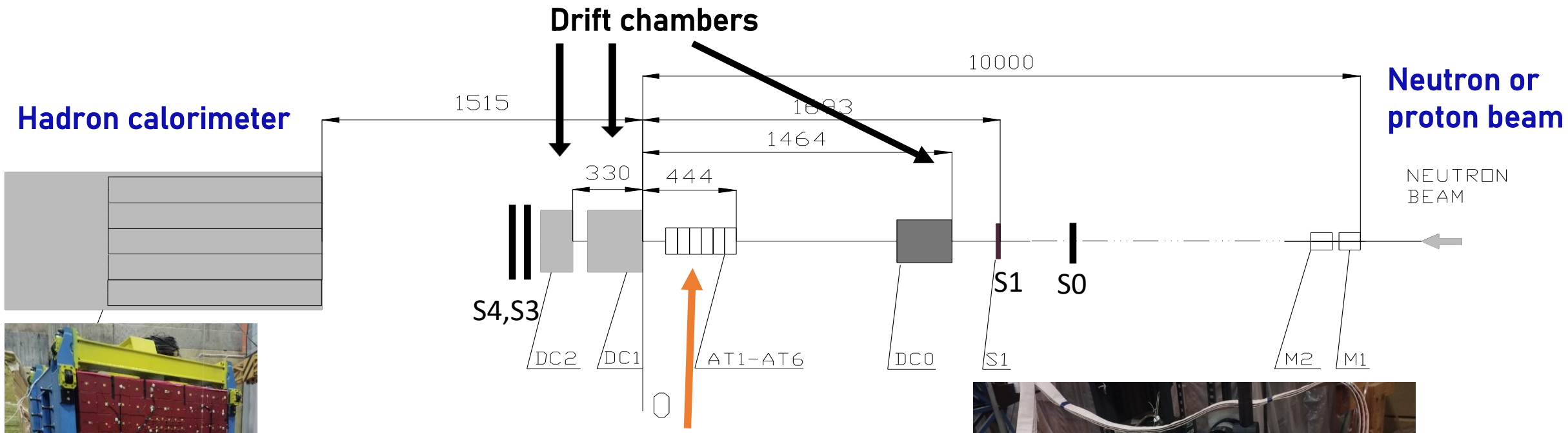


Drift chambers (plane configuration)

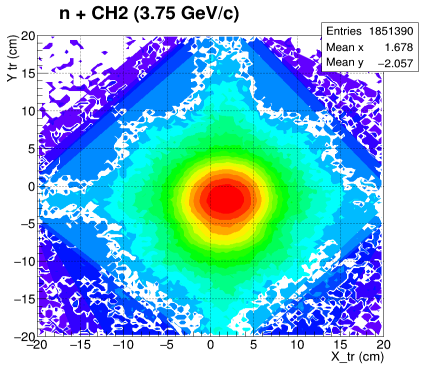
Now 8 planes (4X+4Y) → **Future 12 planes (6X+6Y)**

Calorimeter

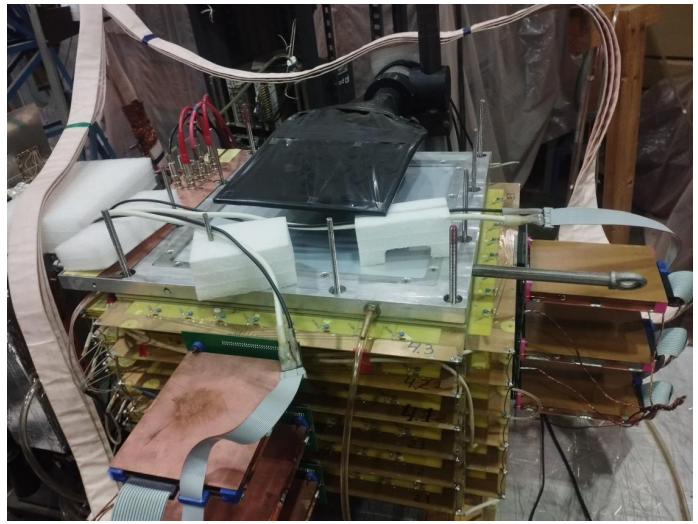
p(pol)+CH2 up to 7.5 GeV/c
and n(pol)+A up to 6.0 GeV/c at the Nuclotron



New hadron calorimeter

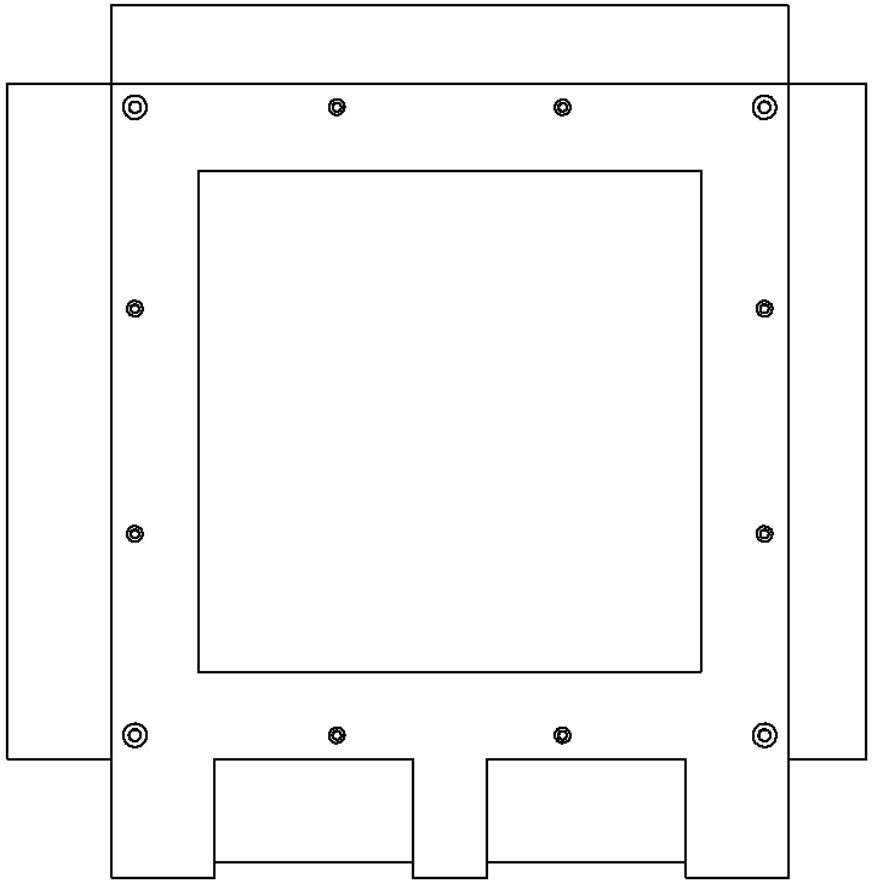


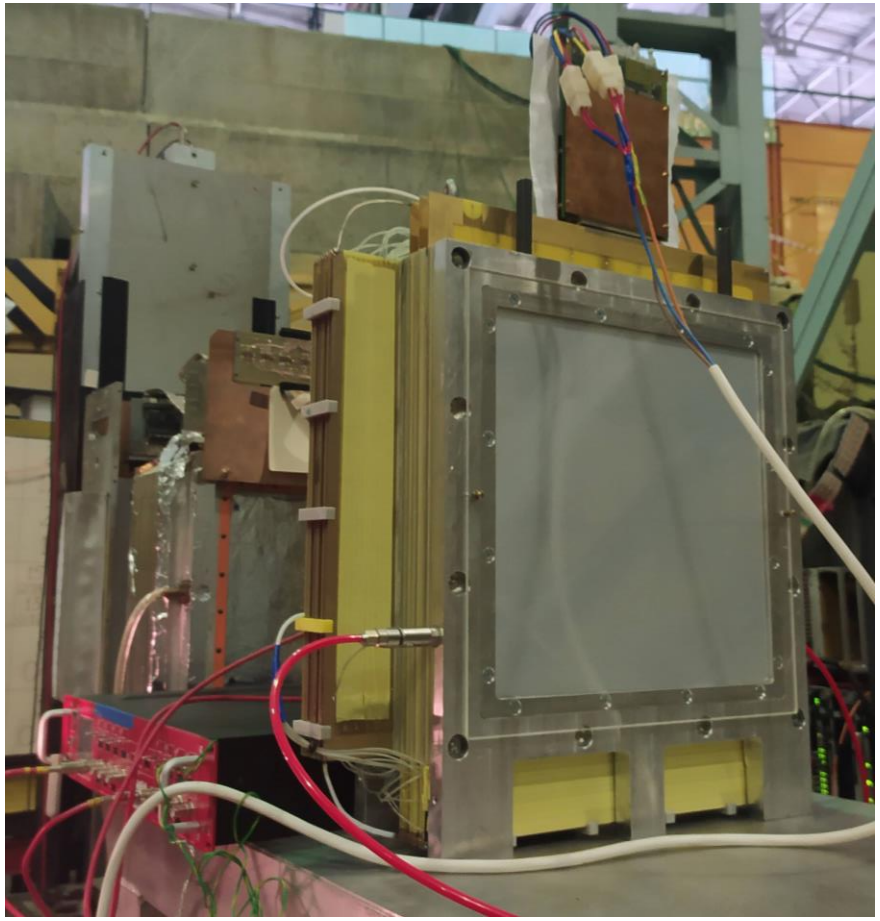
At the CH2 target



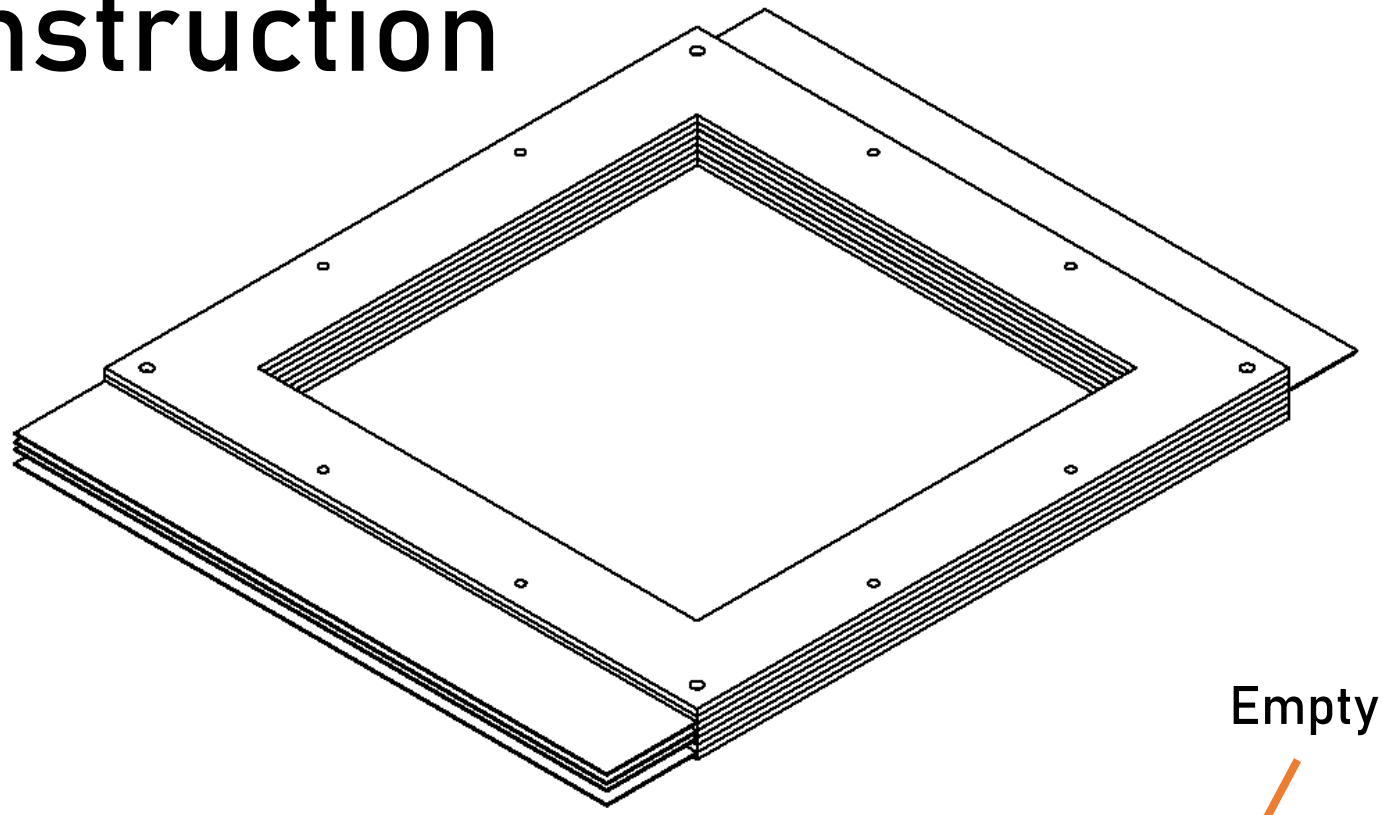
New drift chamber

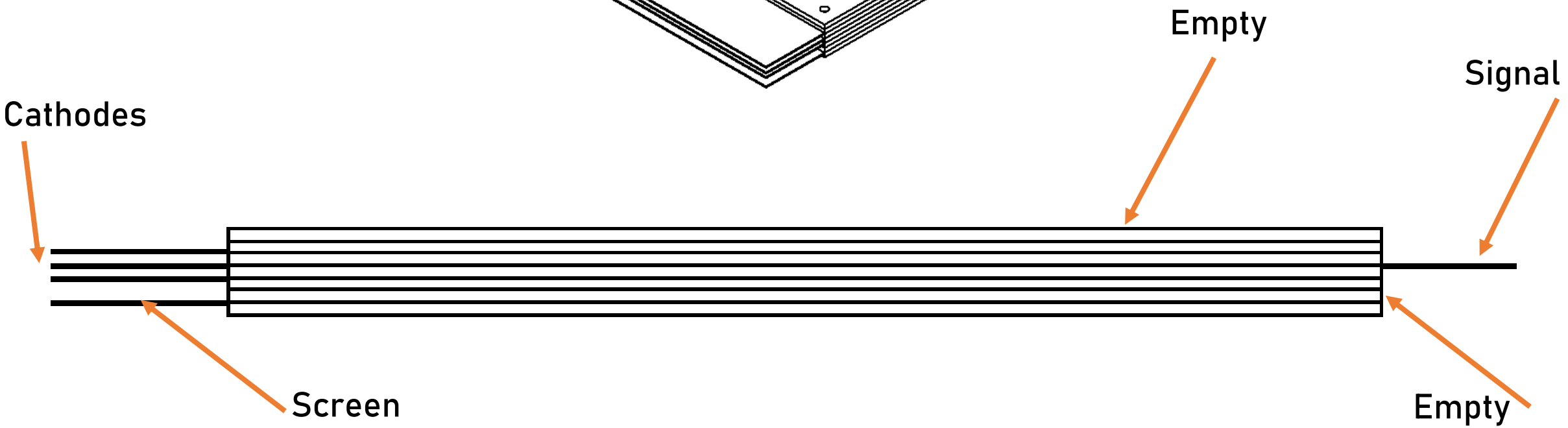
Chamber construction



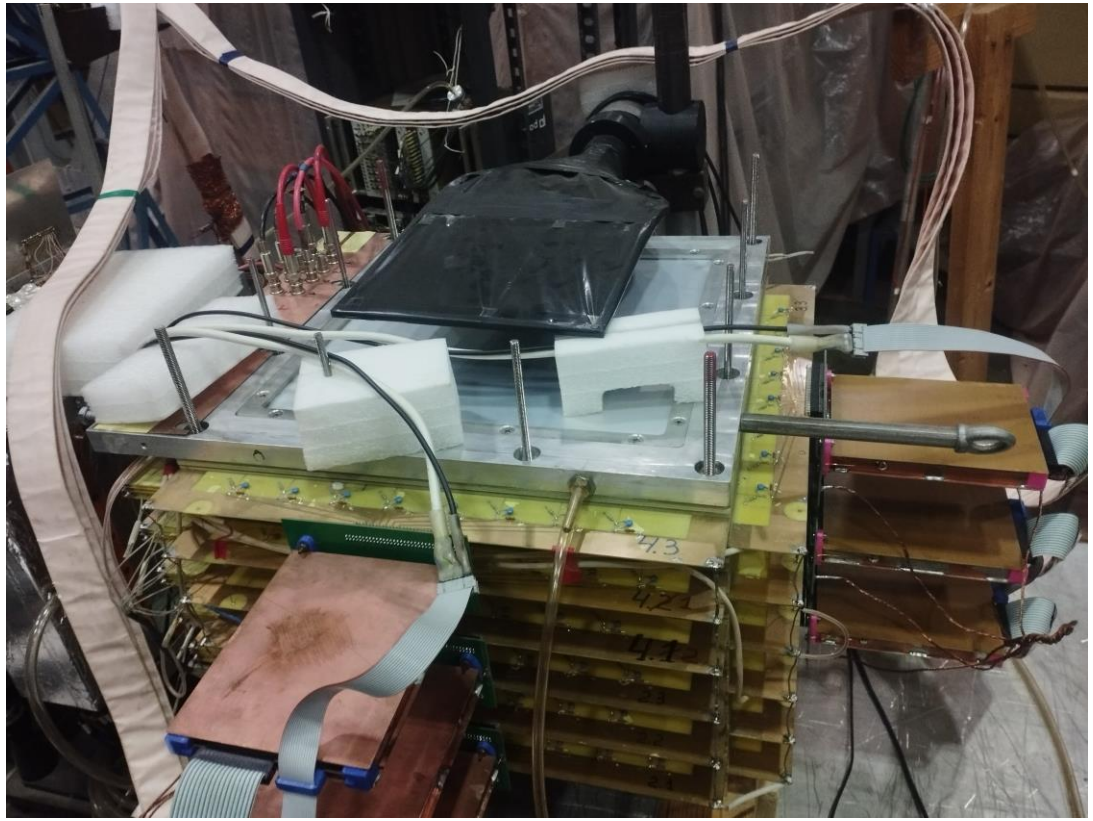


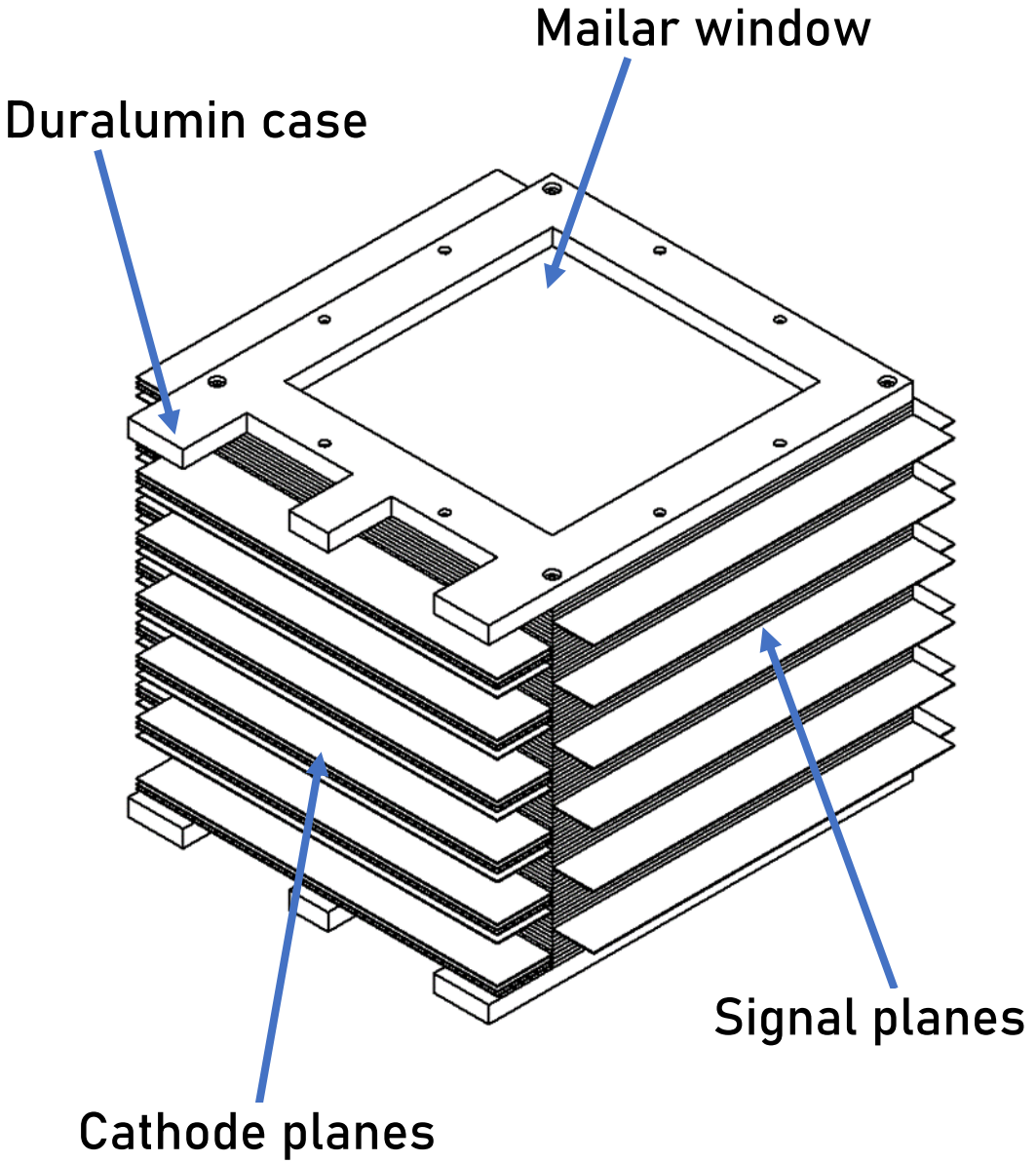
Module construction



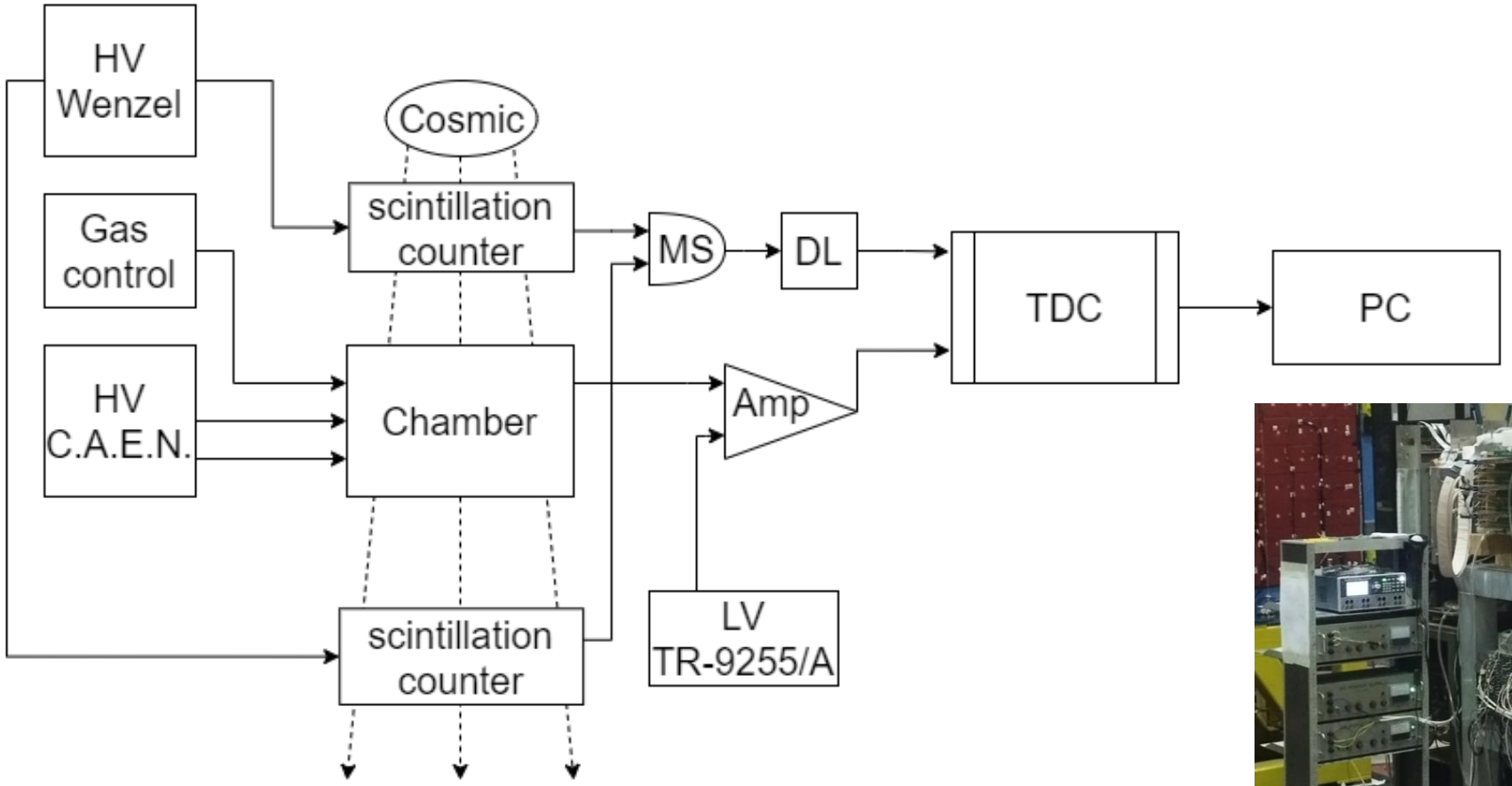


Chamber construction





Stand construction



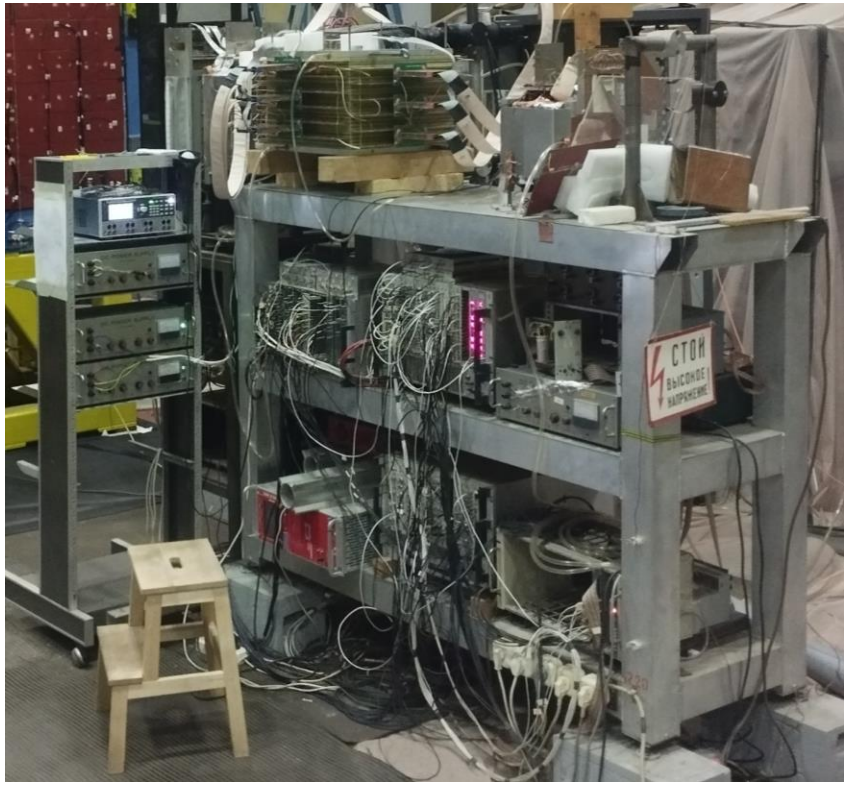
LV - low voltage source

HV - high voltage source

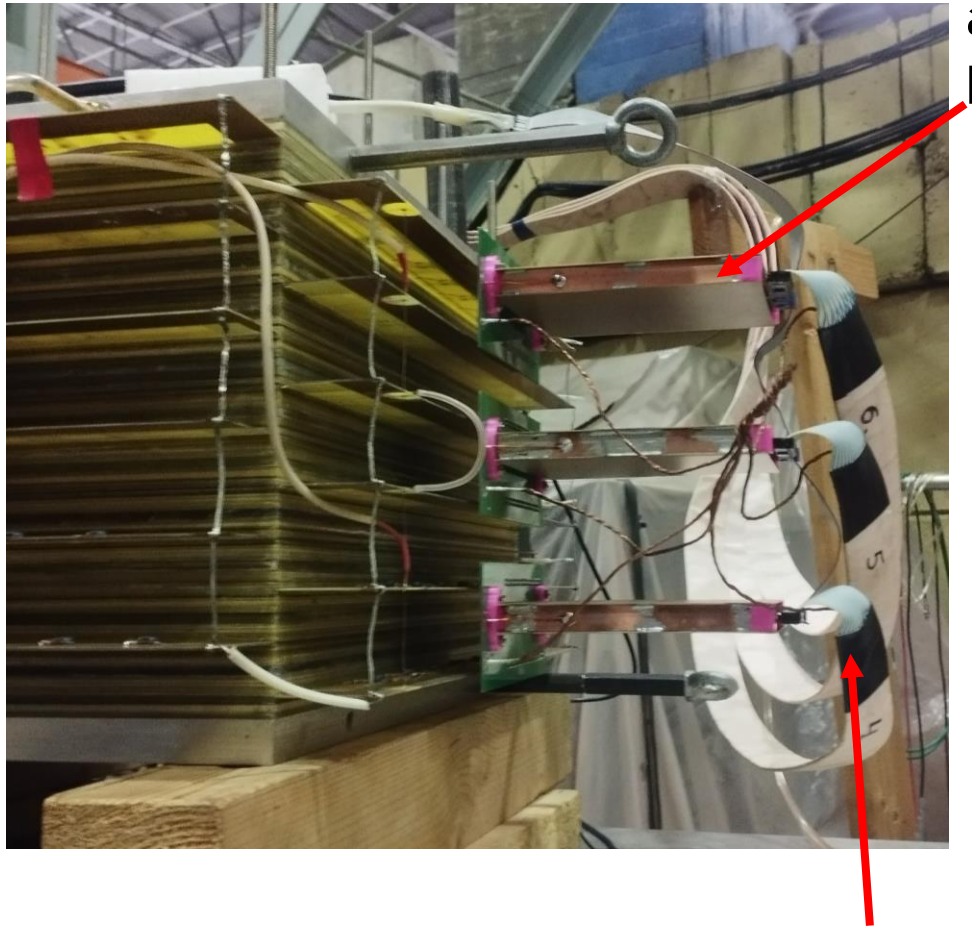
TDC - time to digital converter

DL - delay scheme

MS - matching scheme

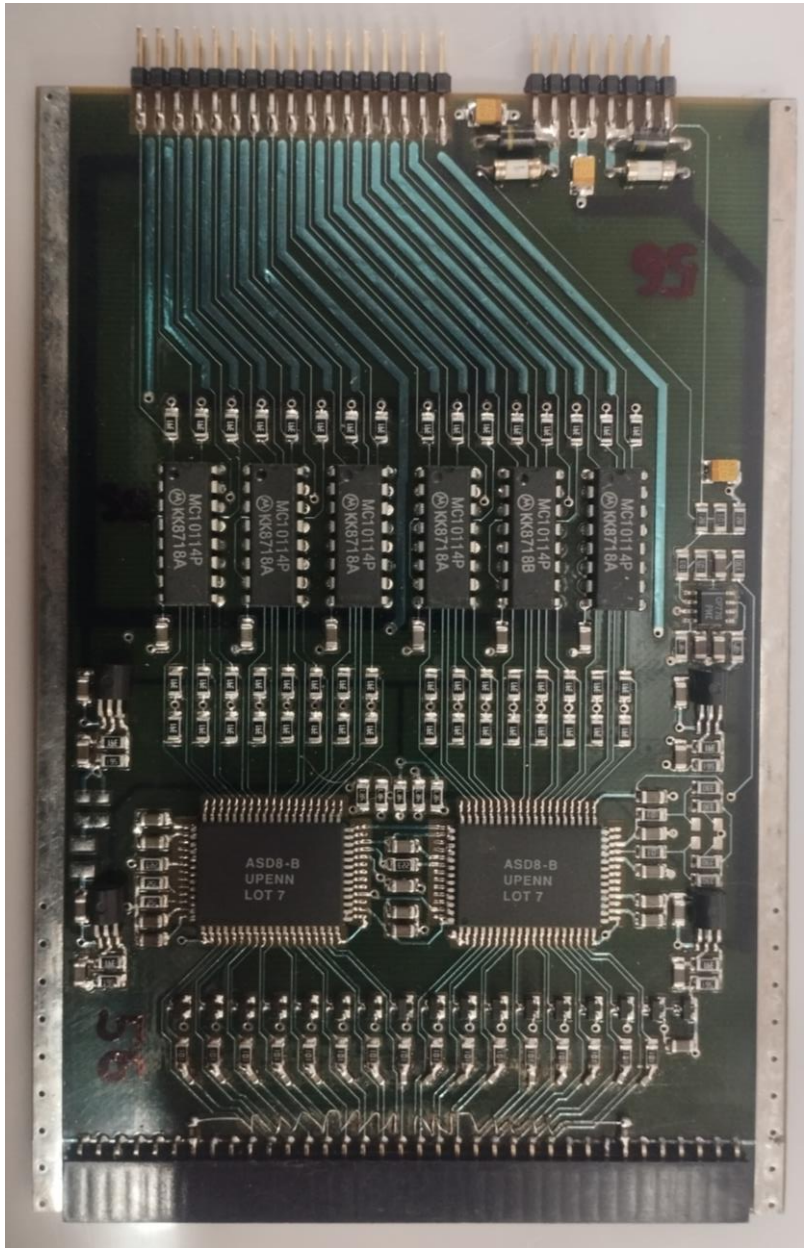


Amplifiers

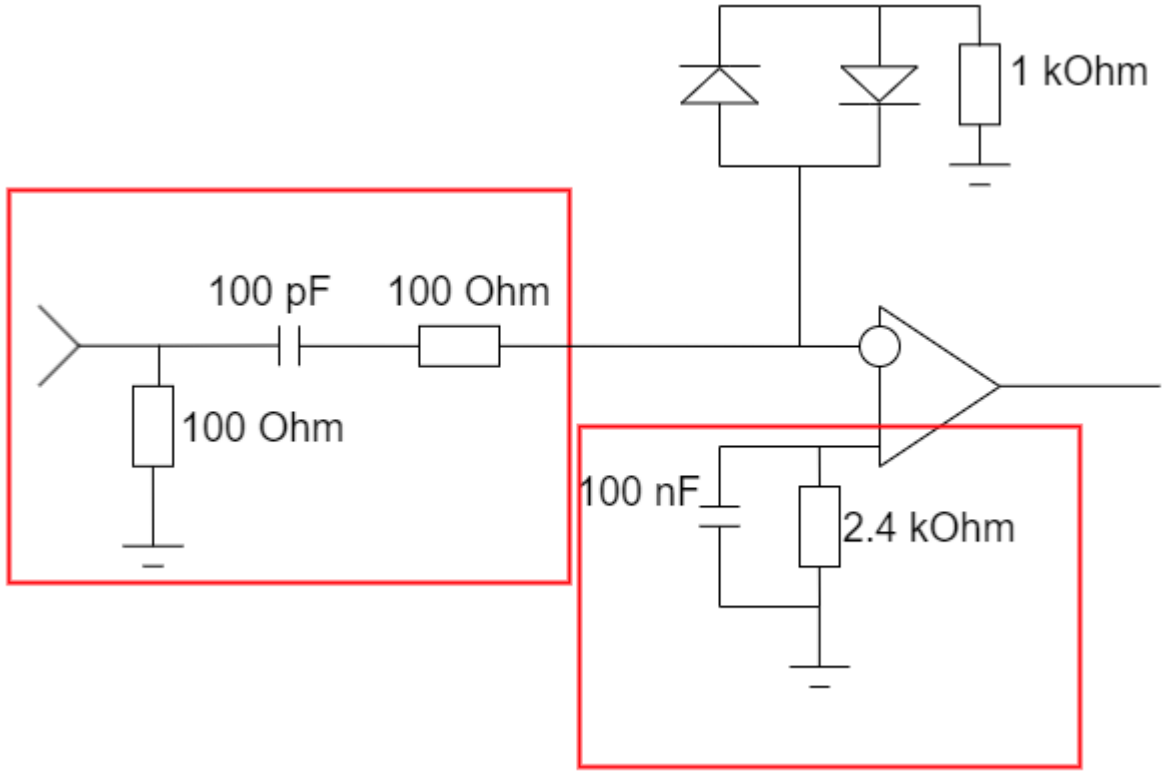


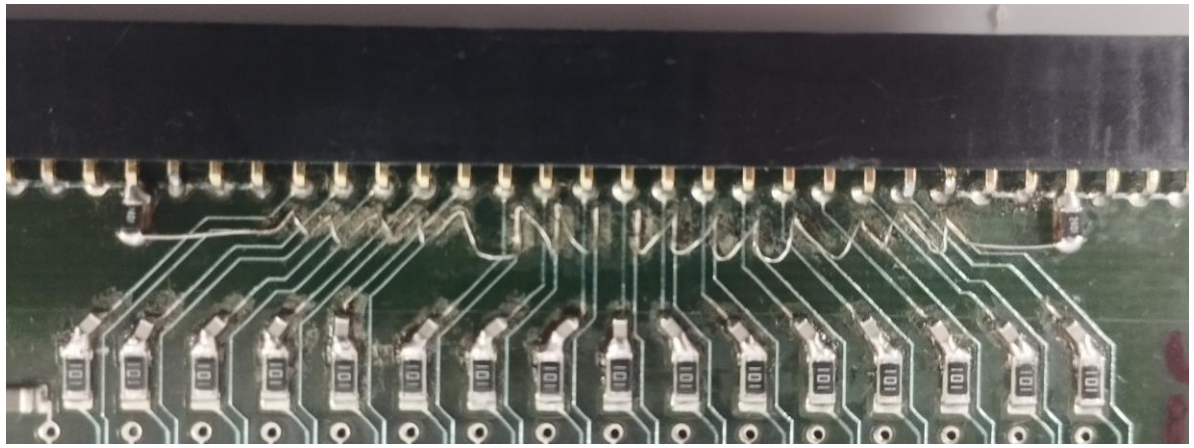
amplifiers in grounded, protected cases

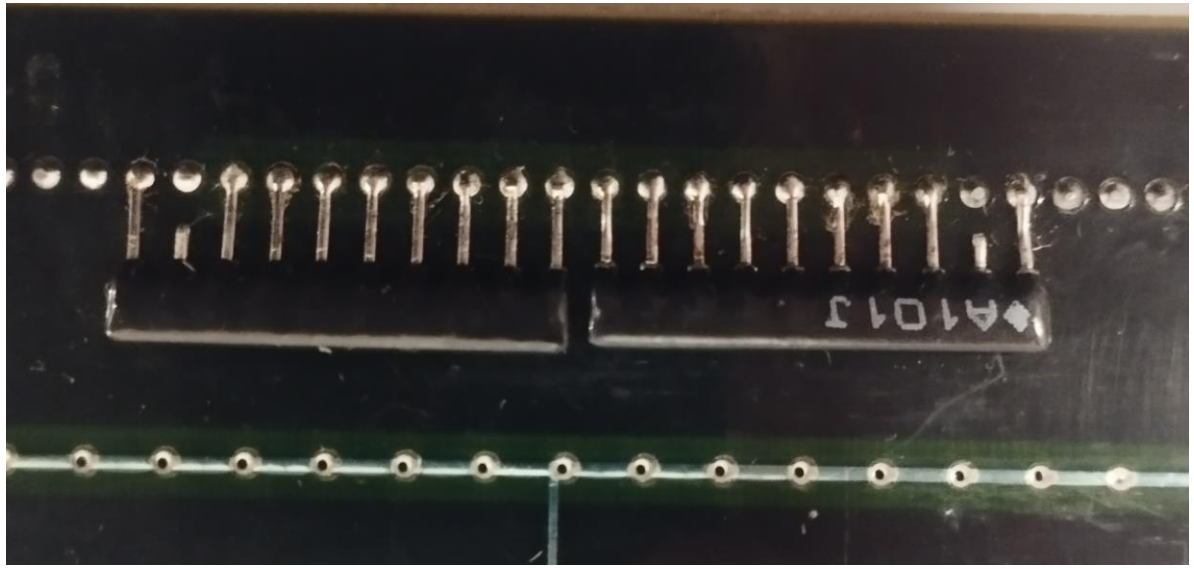
amplifier to crate cables



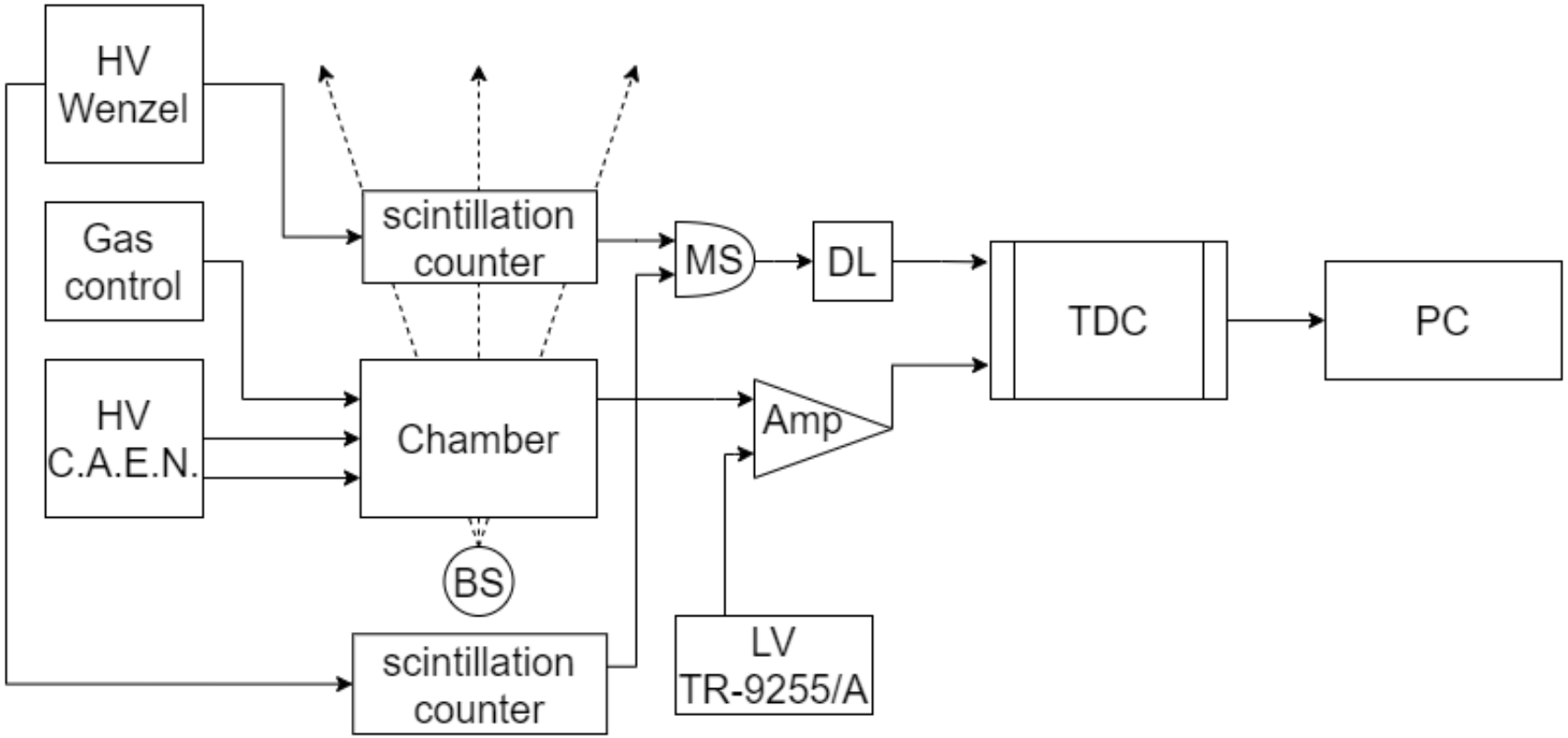
Amplifier upgrade





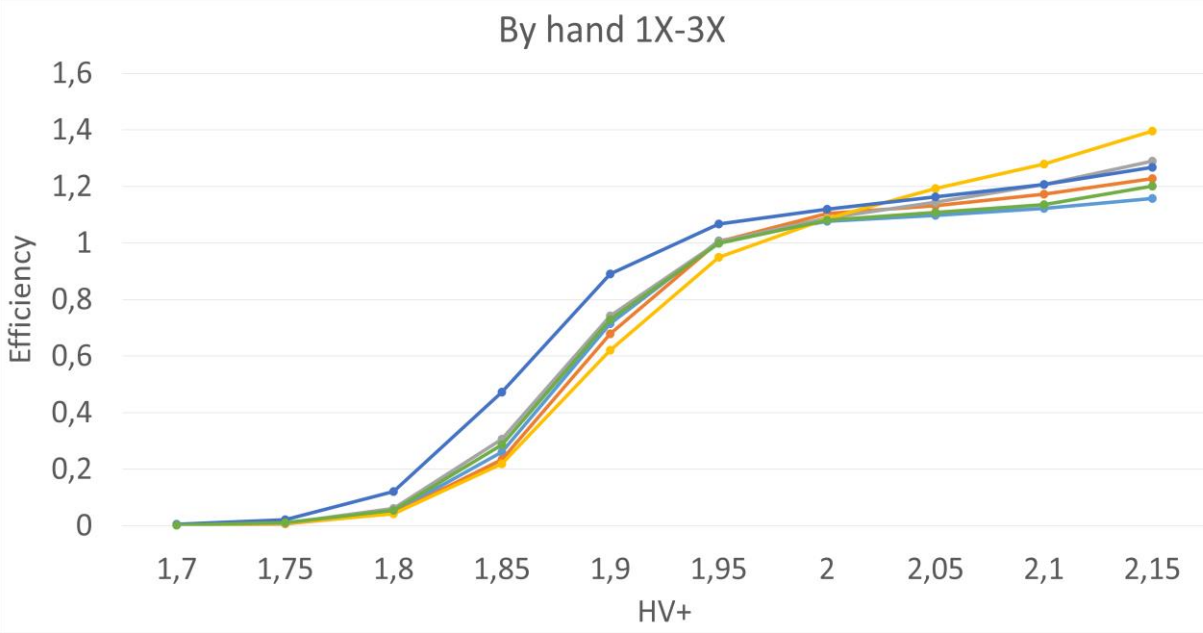


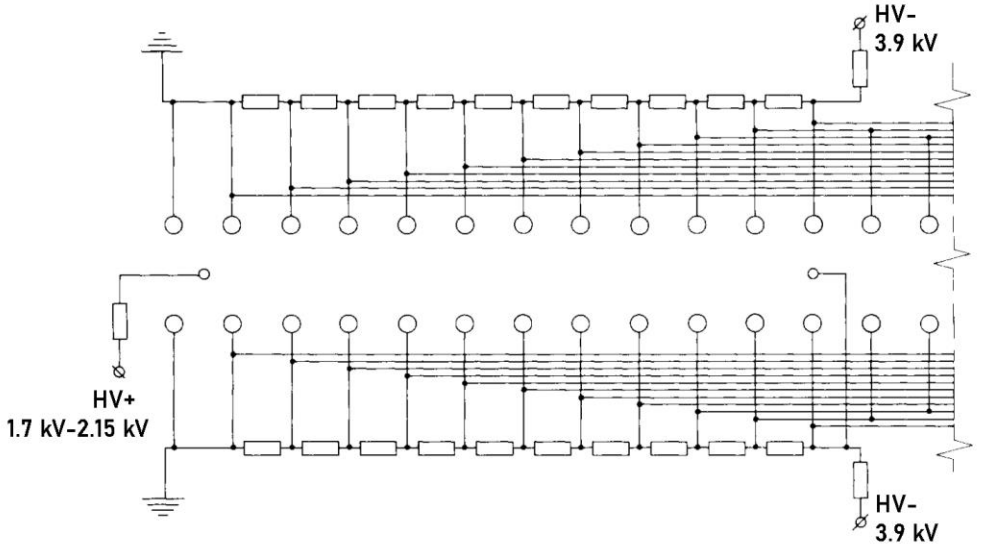
Stand construction

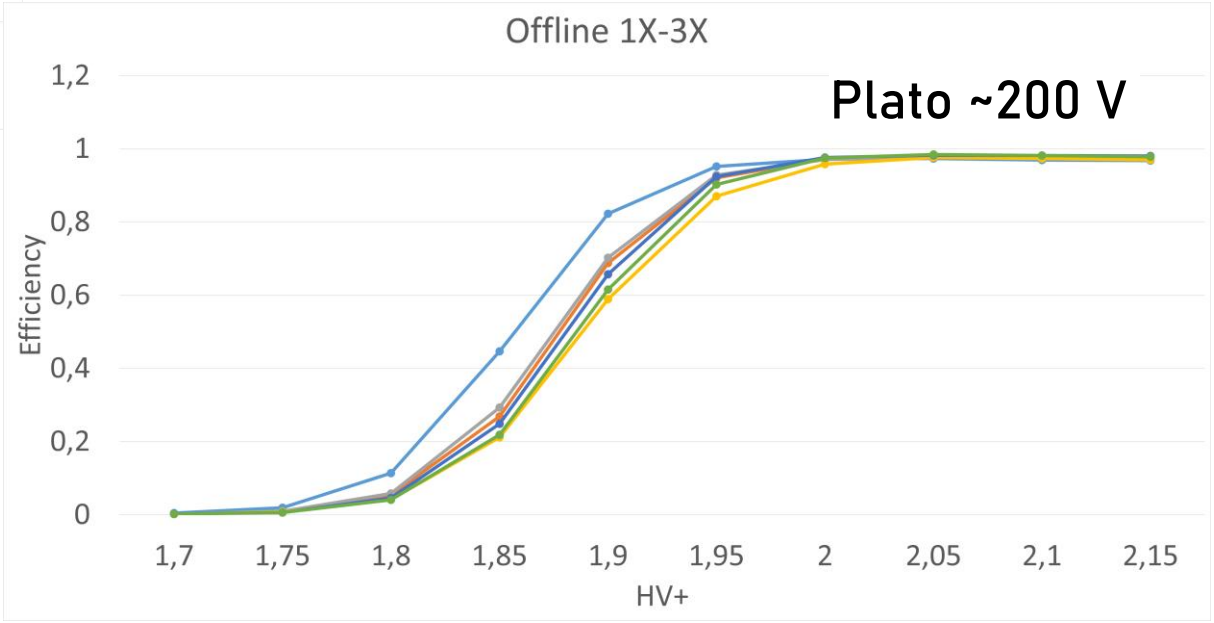


LV - low voltage source	HV - high voltage source	BS - beta source
DL - delay scheme	MS - matching scheme	TDC - time to digital converter

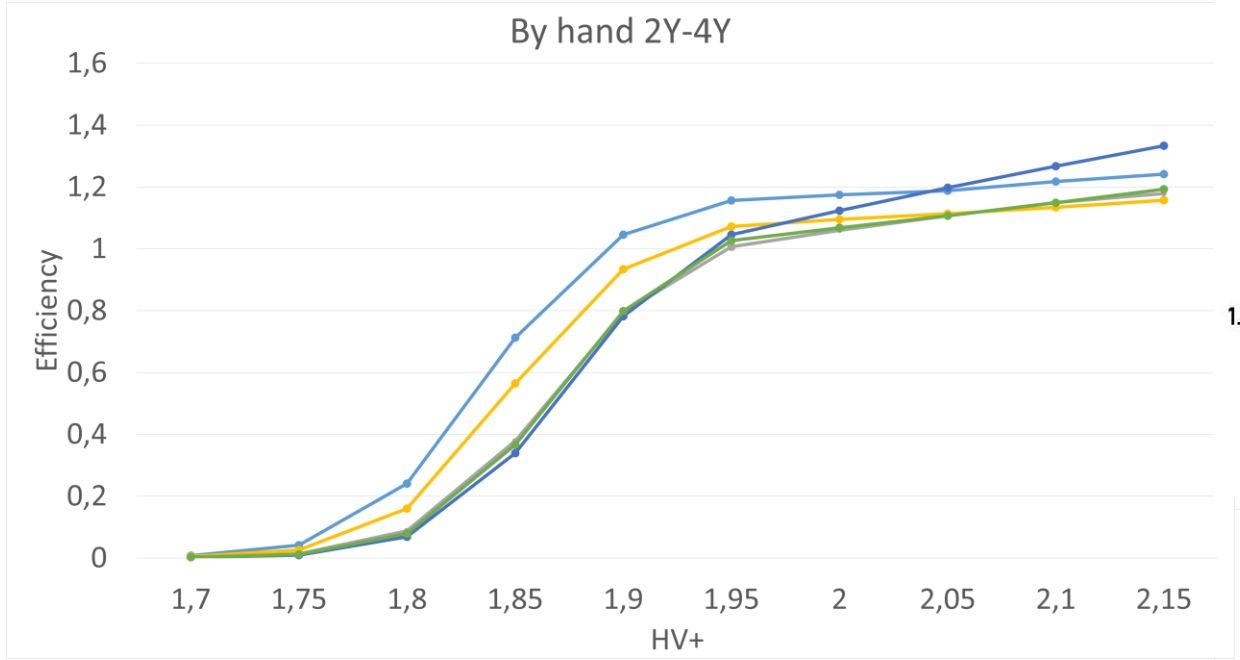
Efficiency HV+

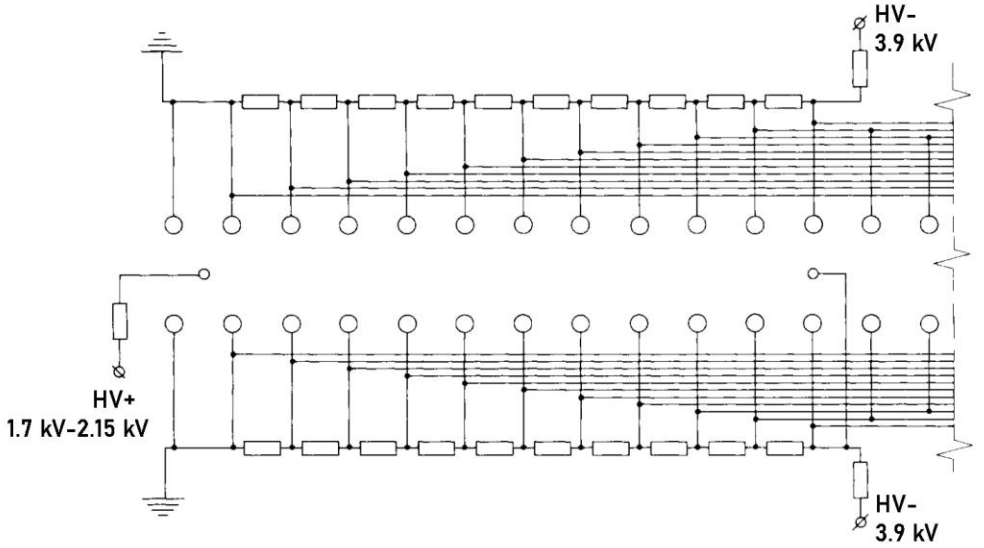


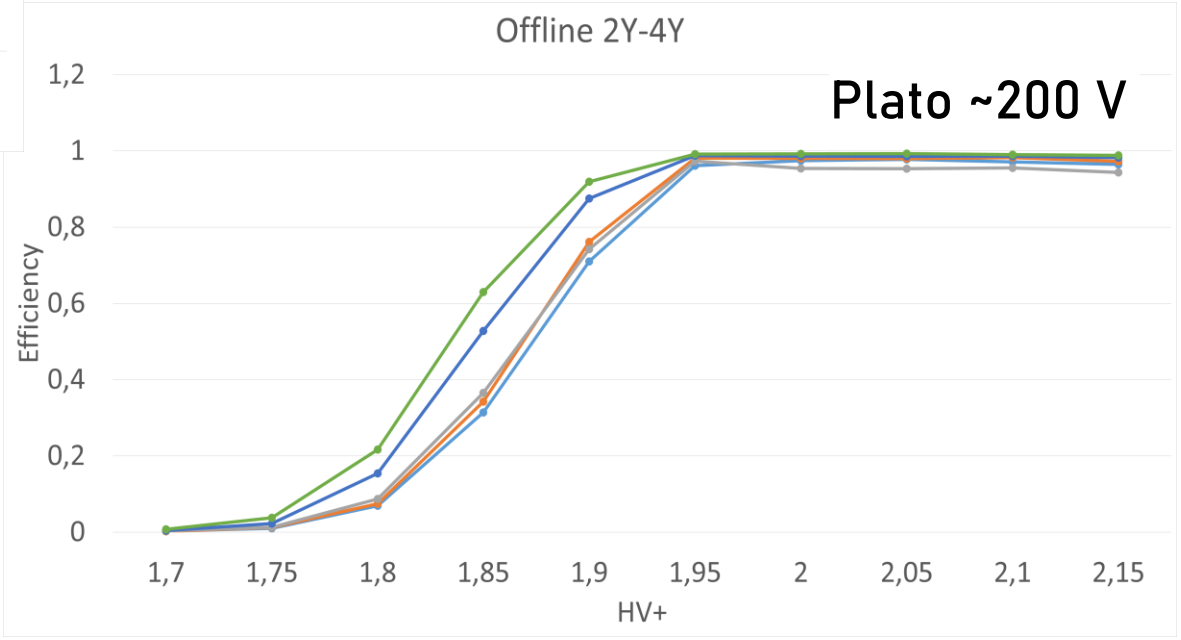




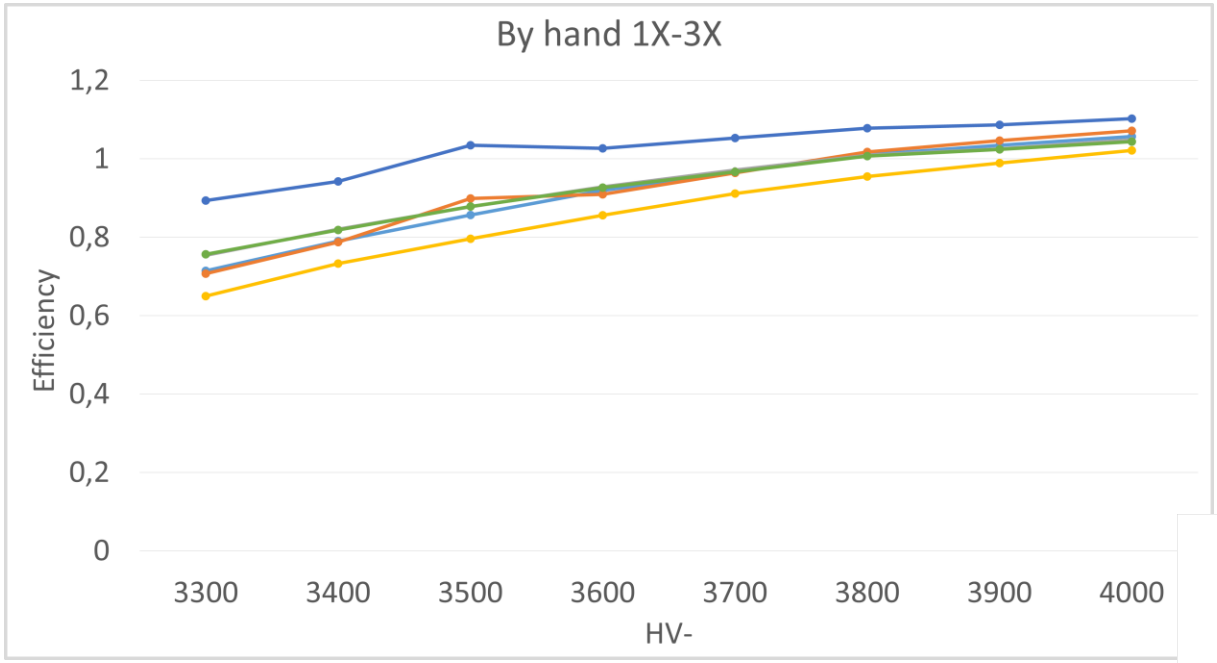
Efficiency HV+

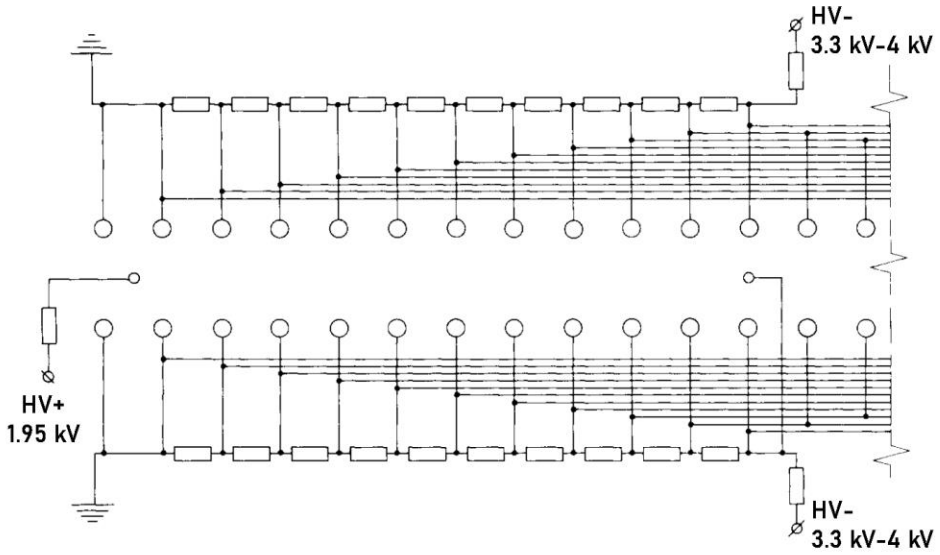


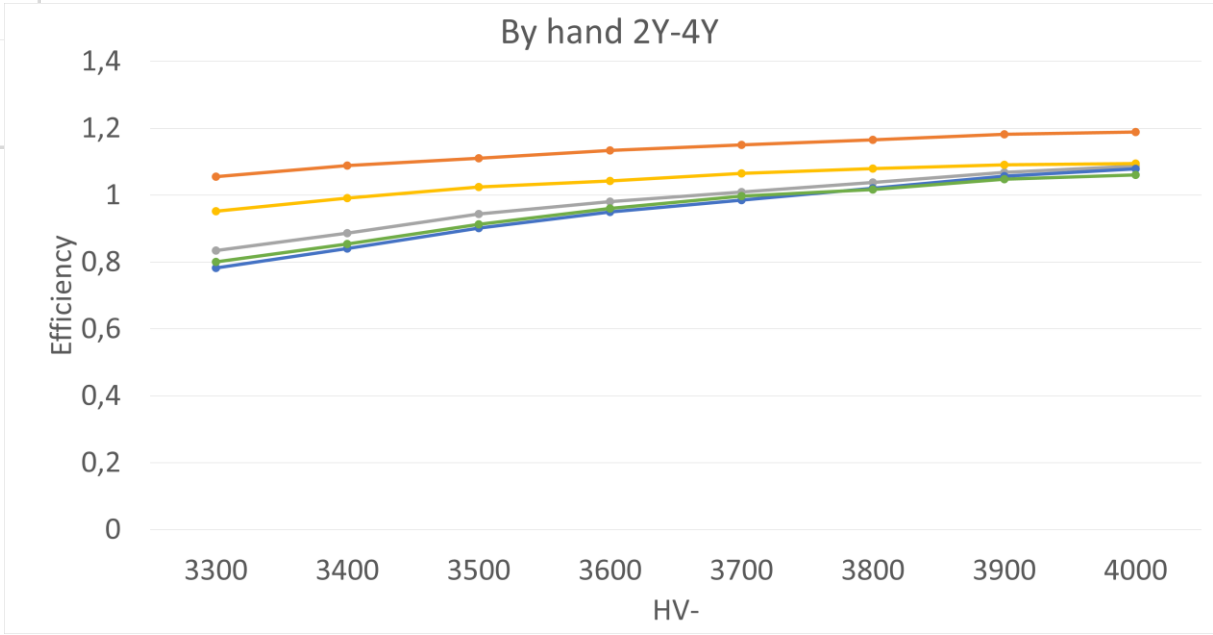




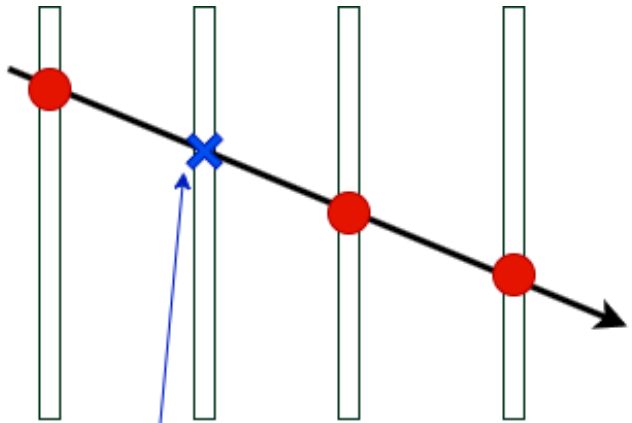
Efficiency HV-



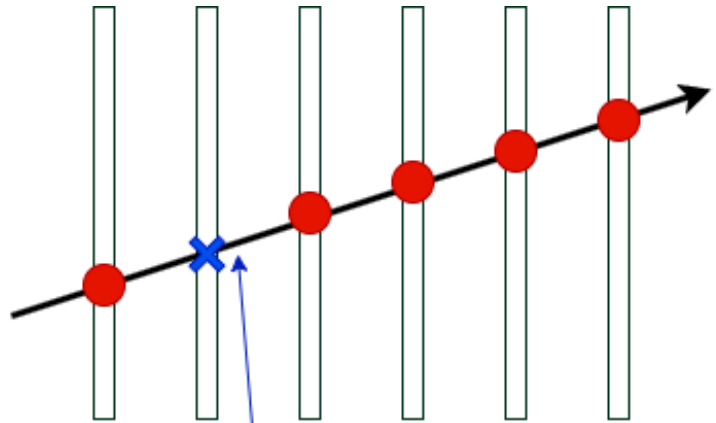




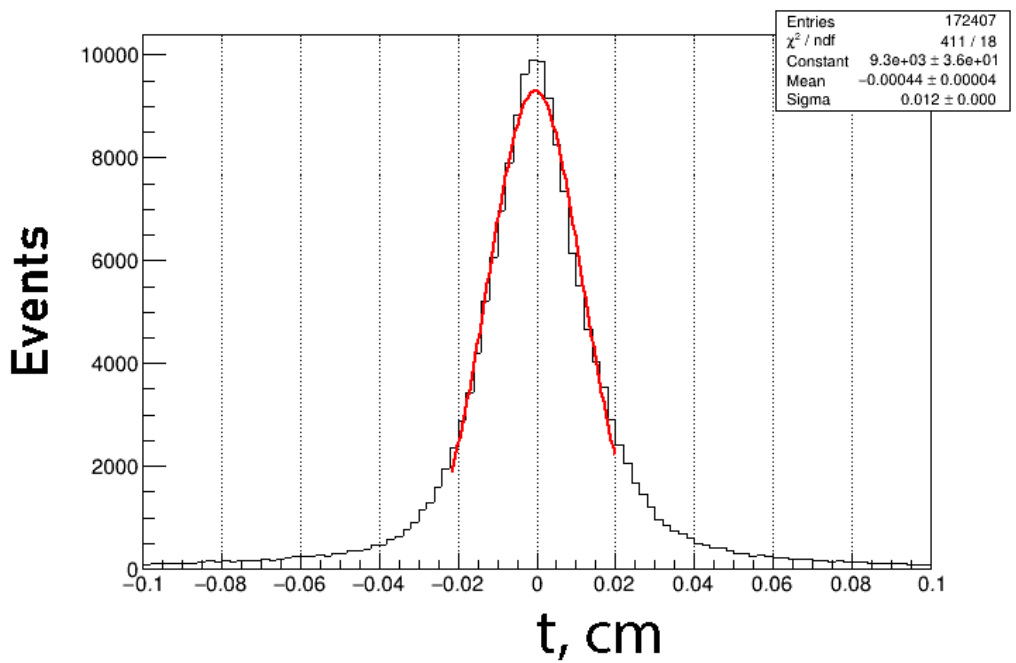
Resolution

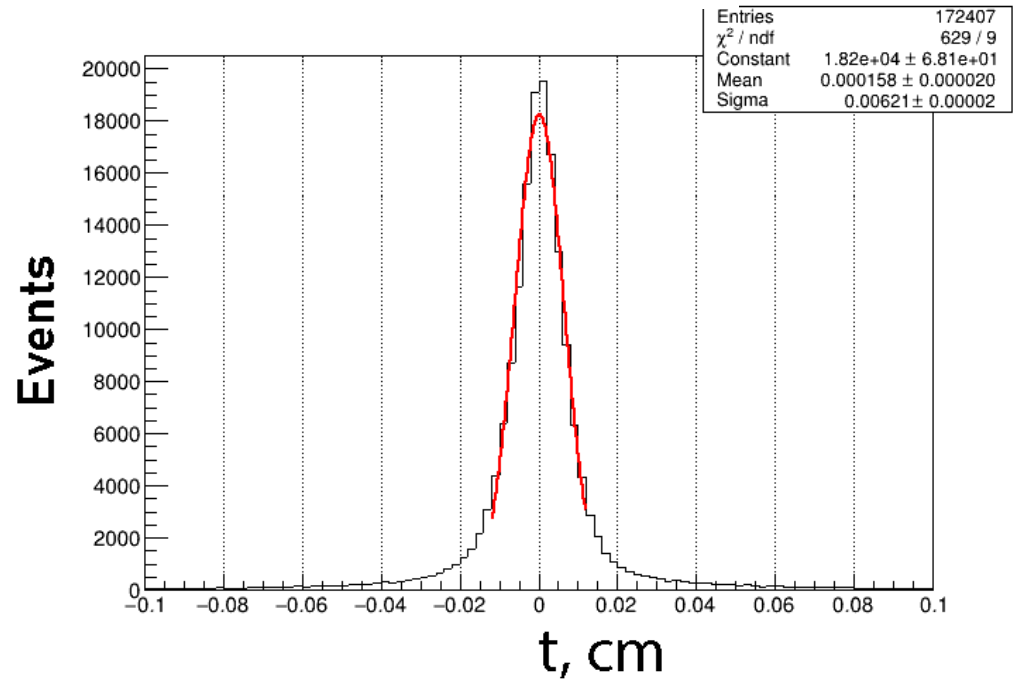
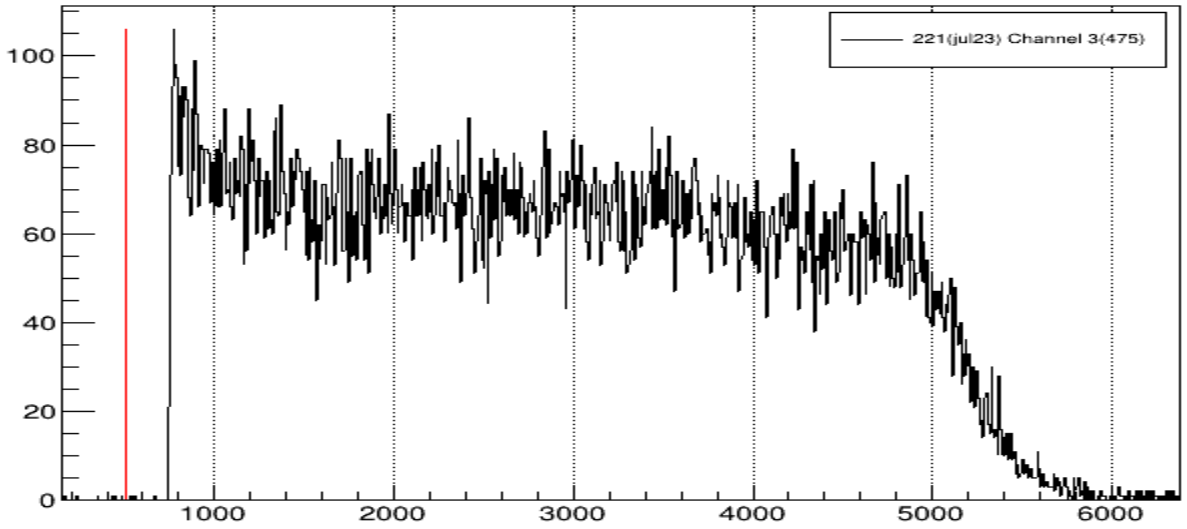
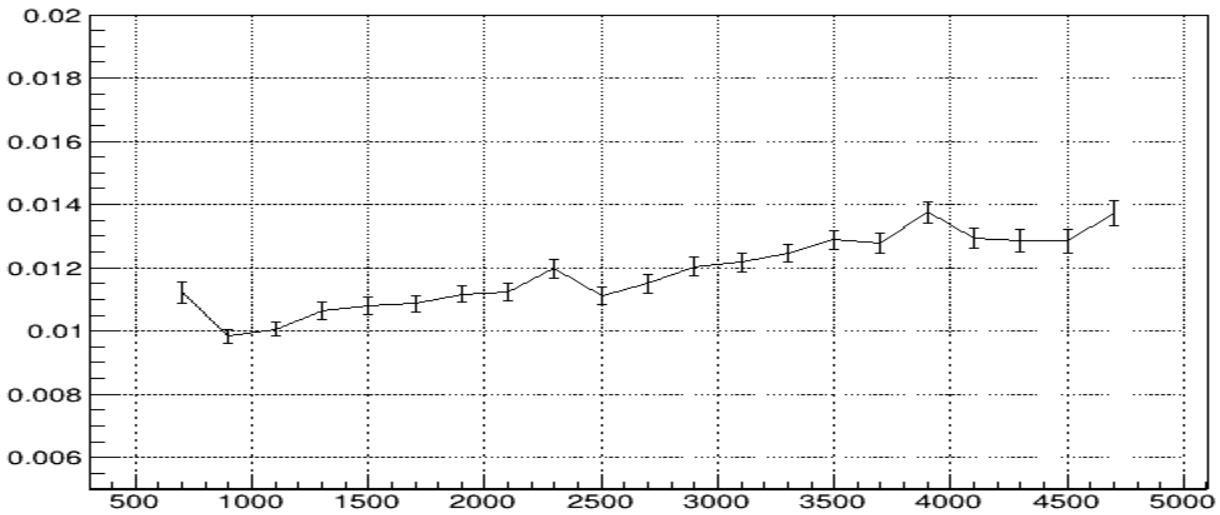


Sigma = 120 mkm



Sigma = 62 mkm





Time spectrums