Instrumentation

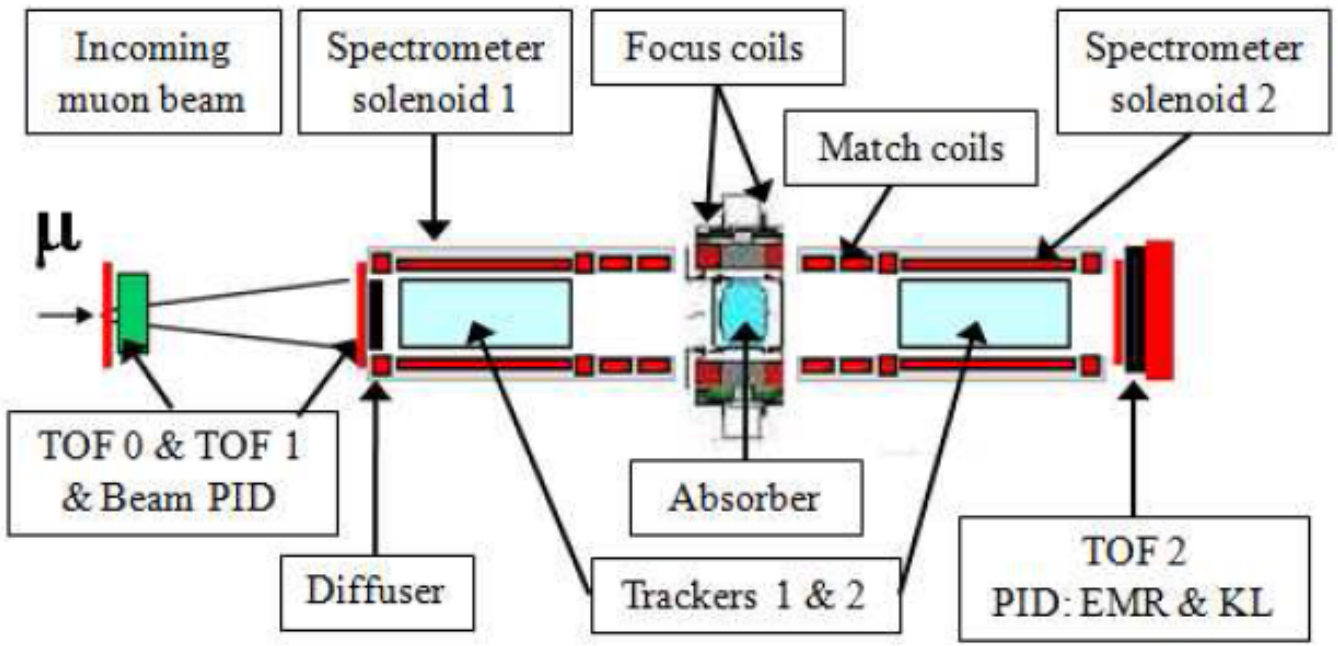
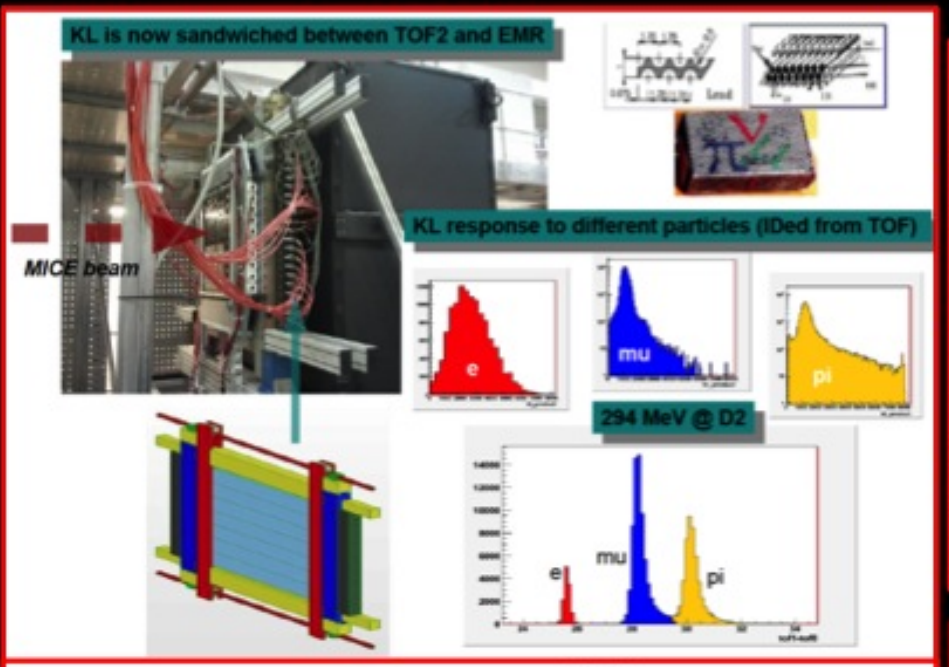
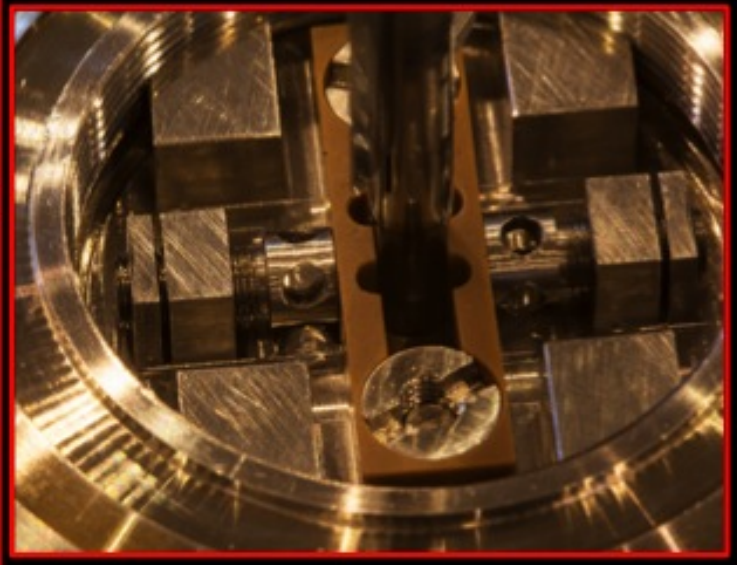
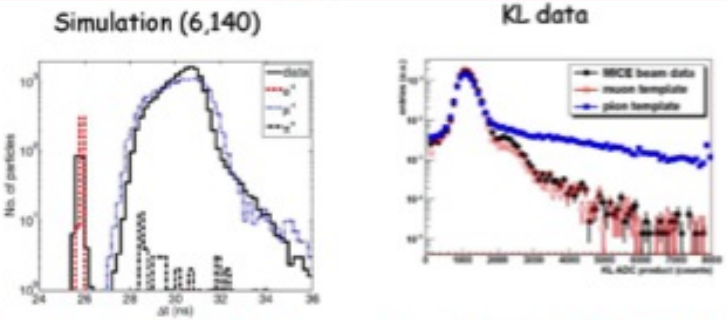


Figure 1: Step IV configuration of the MICE Experiment.

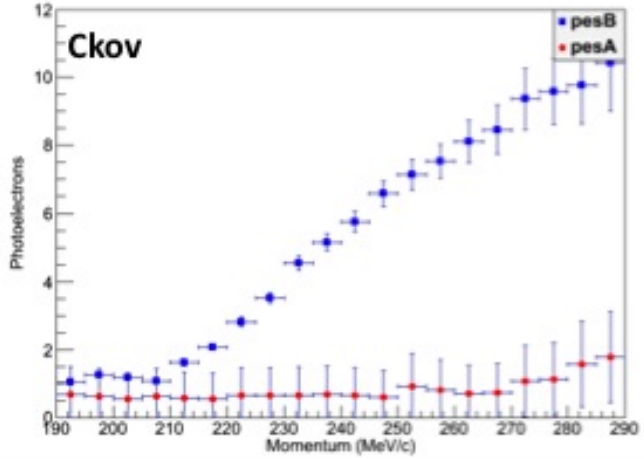
Particle identification and target:



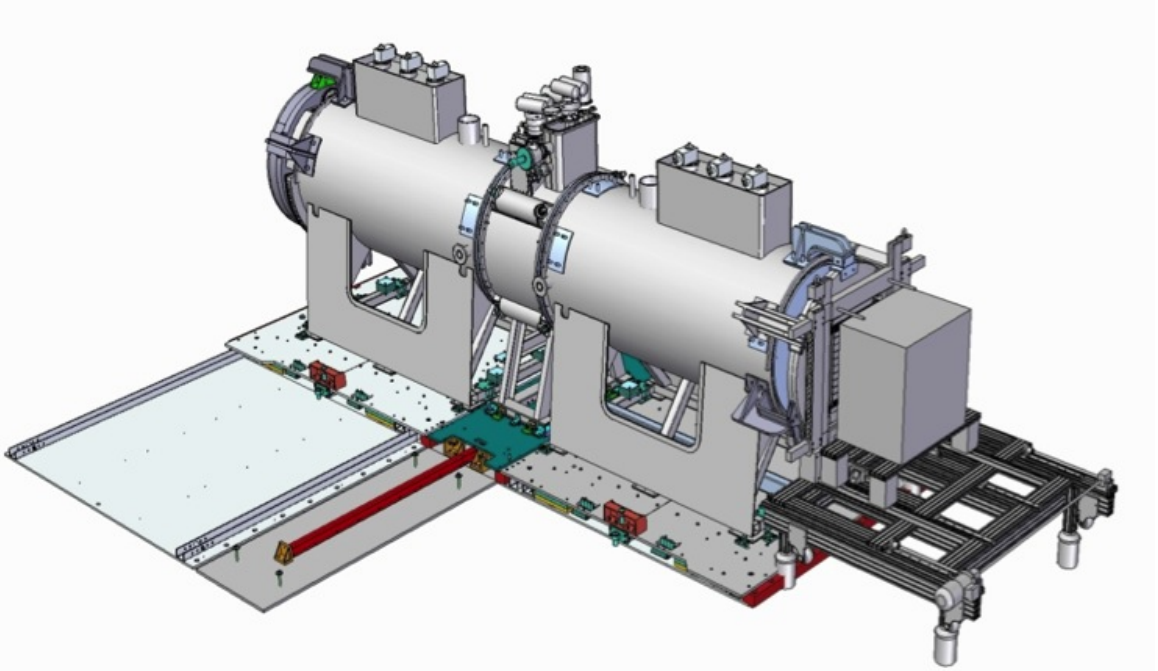




- **Pion contamination in MICE muon beam determined via TOF & KL at < 1%**
  - Muon and pions templates in KL from calibration data
  - Data & MC in agreement with pion contamination < 1% at the entrance of the cooling channel



Instrumentation



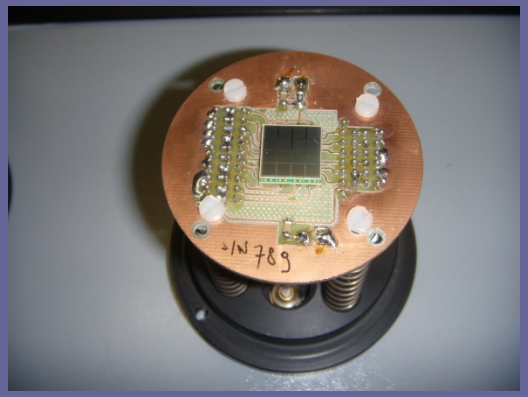
- Target
- TOF
- KL
- EMR
- CKOV

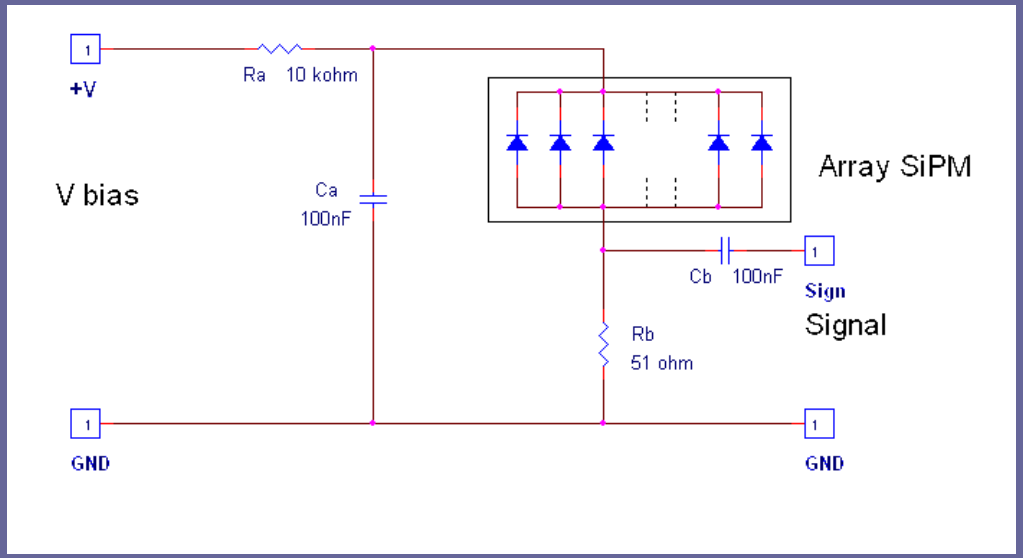
- TOf1 shielding
- Tracker shielding

dear Lucien
for the TOF as detector there is nothing new, aside tests we are doing on SiPMT arrays readout. The real problem is that the cage+Virostek are not properly working and give a field at TOF1 much higher than originally computed. The last computation by Holge gives
field with a longitudinal component at the level of 150-200 Gauss:
a factor n x the previous one. So the cage shielding will not work.
This is only a problem for TOF1. TOF2 has not this problem as local shielding was implemented. Best Maurizio

Solutions:
- Active shielding of tof1 pmts
- SiPMT solution

Readout chain for SiPMT arrays

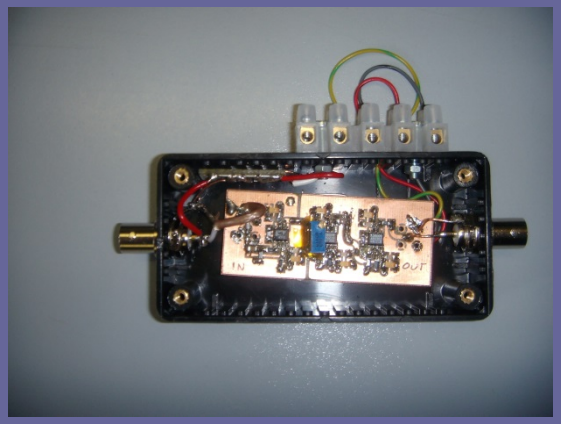


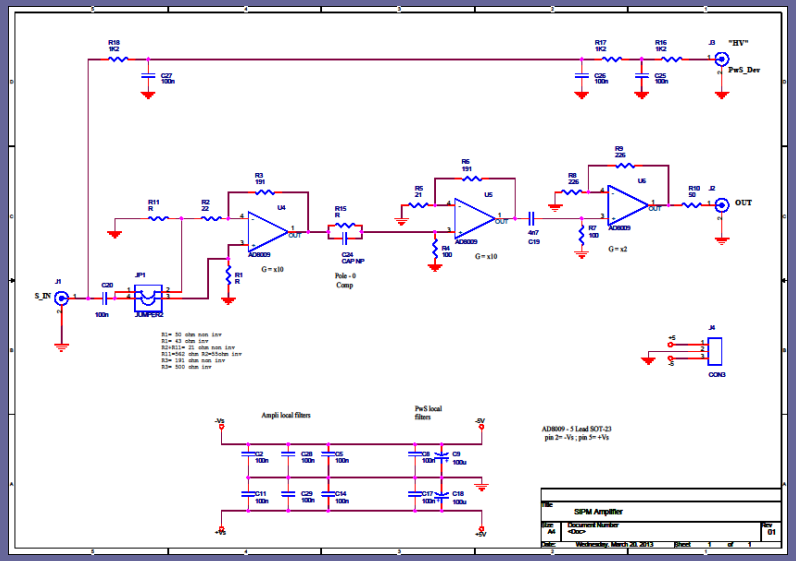


- SiPMT array custom mount
- 16 macrocells signals are summed up in the basette and then amplified

Schematic of one ``basette''

Custom amplifier



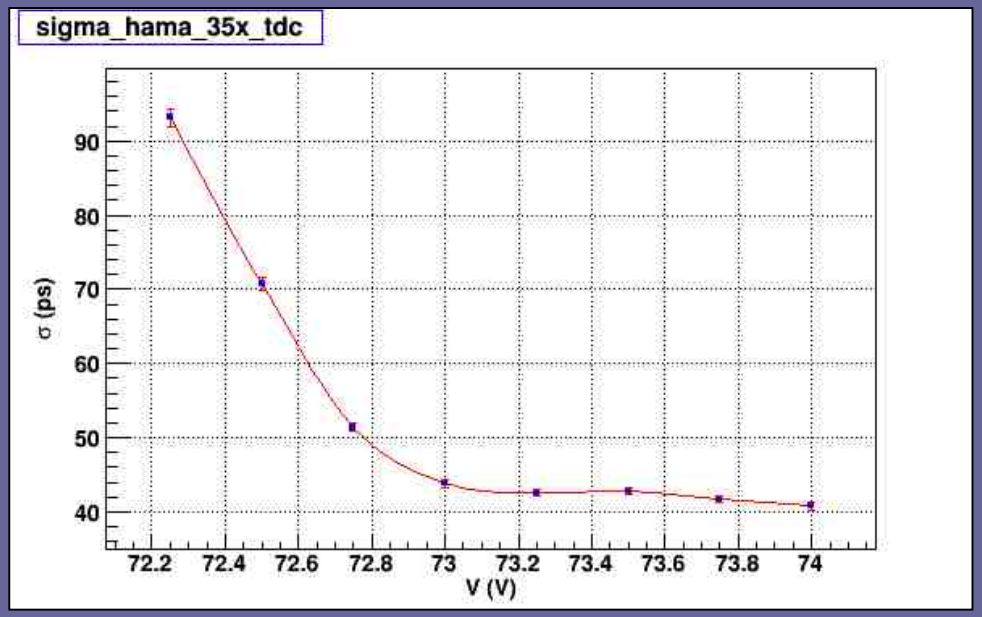


Amplifier:

- Custom made (INFN Pv)
- 1 or 2 channels
- Gain up to 100X (30X with pole zero suppression)
- Input dynamic range: 0-70 mV
- Bandwith : 600 MHz

This may limit timing response, tests will be redone soon with a 50x PLS 774 amplifier (bandwith ~1.50 GHZ)

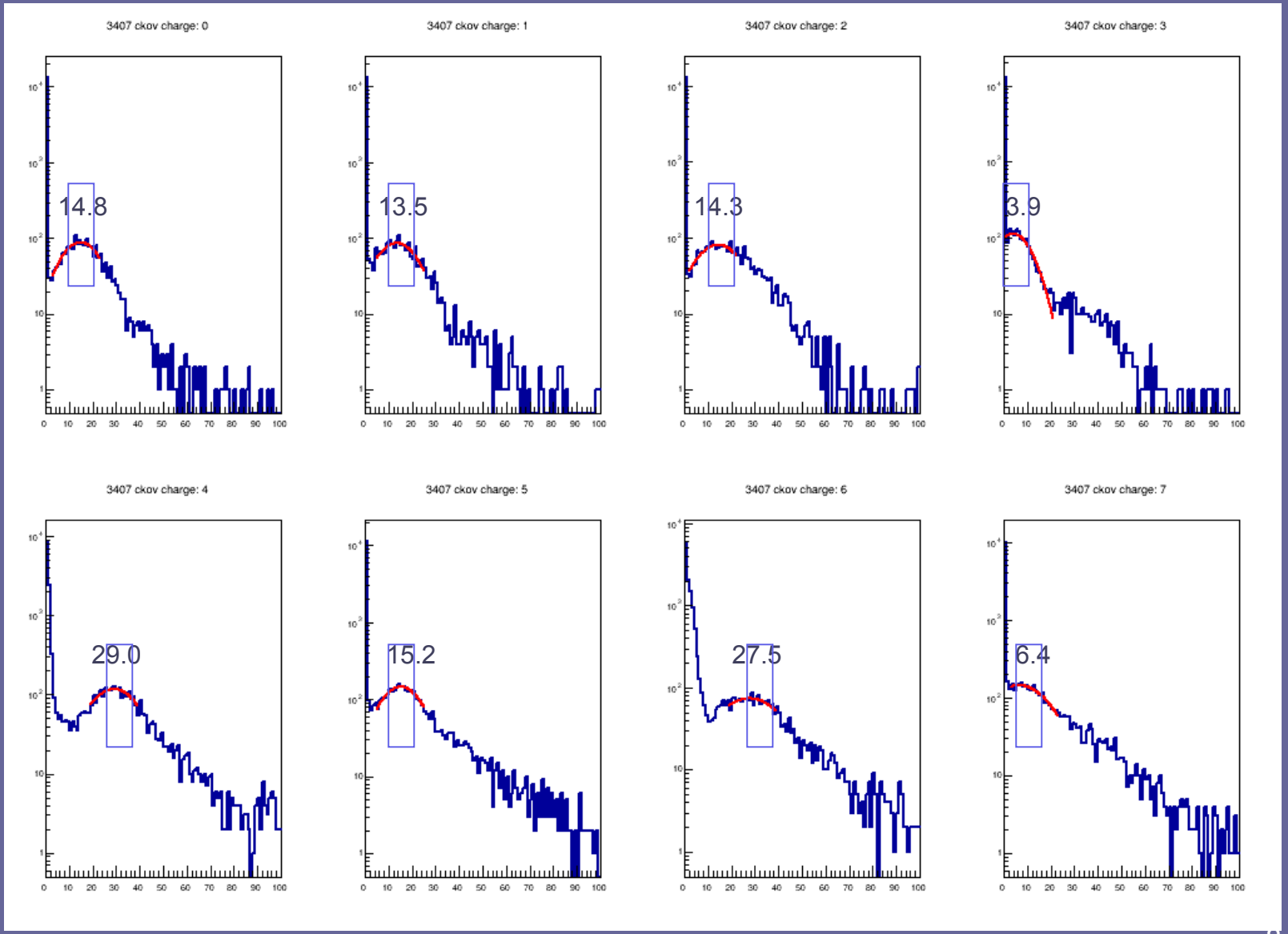
Results with Hamamatsu S11828 Arrays



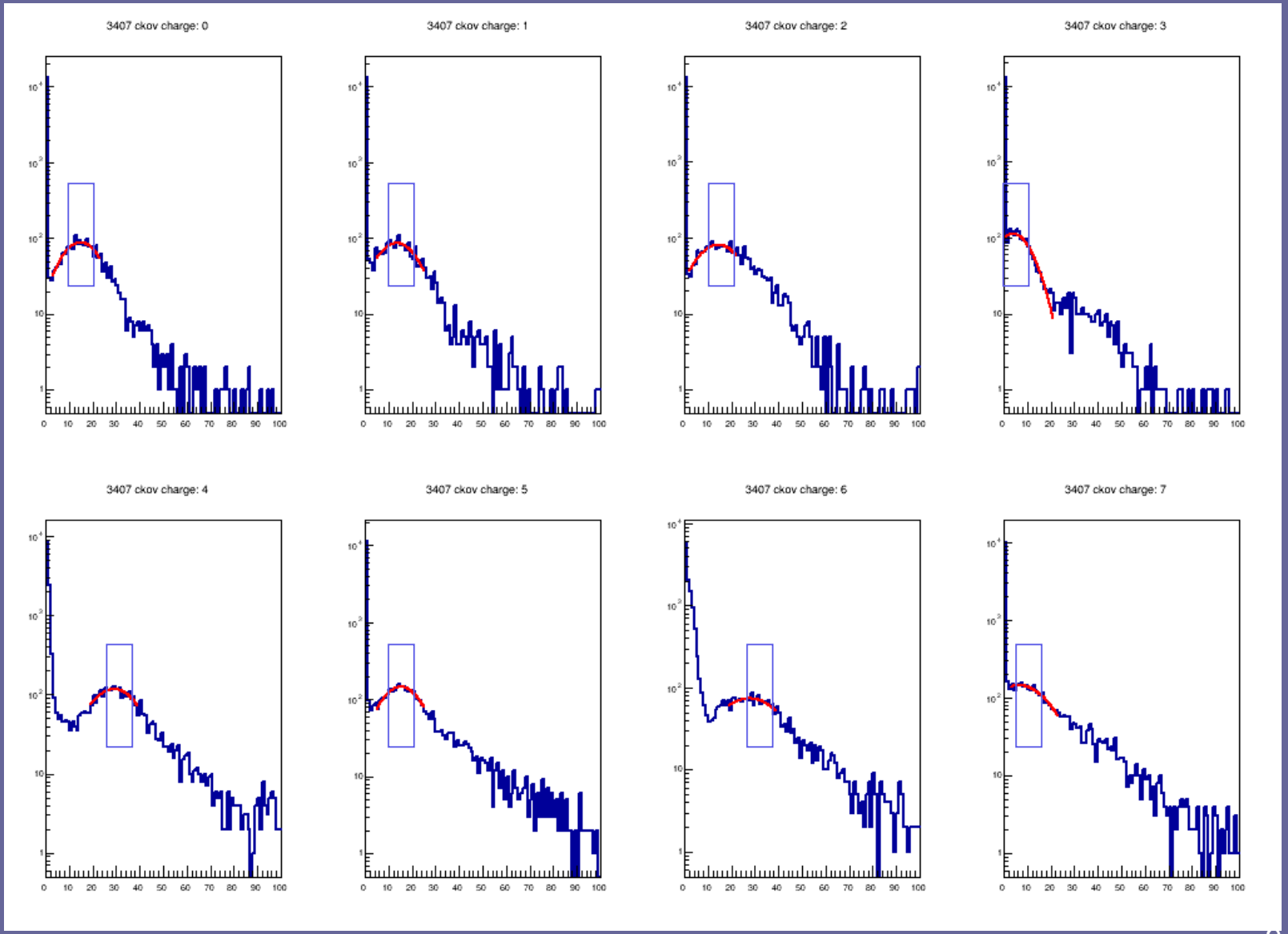
Standard light intensity

We foresee soon tests with Hamamatsu S12642 arrays, TSV package, where better results may be expected

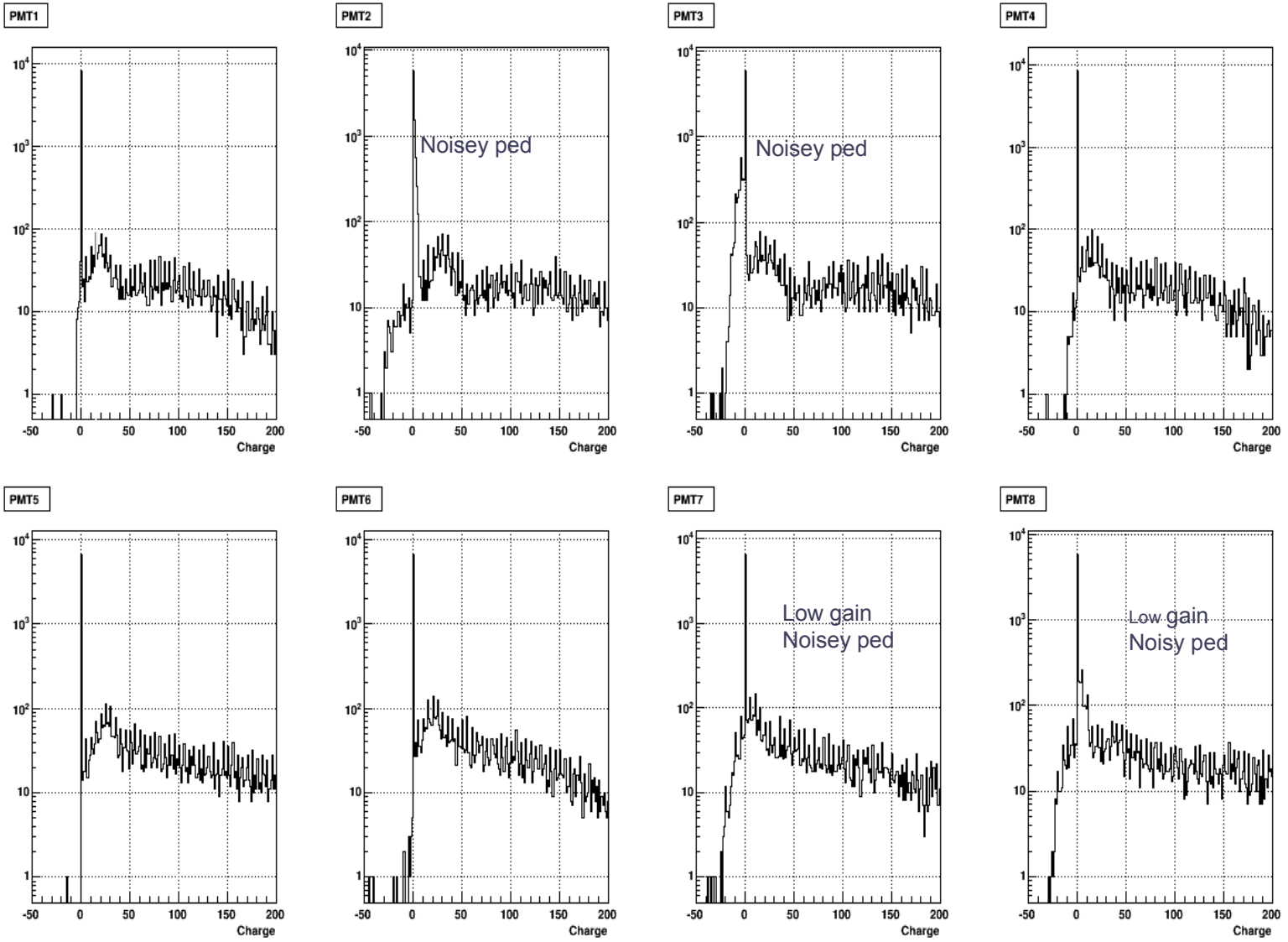
Ckov ADCs Run 3407 (08/12/11)



Ckov ADCs Run 4082 (19/05/12)



Ckov ADCs Run 5678 (2013-10-27)



Instrumentation Summary

1. PiD instrumentation in good working order, less tof1 wrt pmt shielding.
2. Tracker solenoids on track.
3. Tracker shielding being solved.

1. SiPMT arrays may be a good repacement for fast PMTs in scintillator time-of-flight systems.
1. Preliminary conclusions show a “comparable” timing resolution with fast PMTs
2. Results must be validated by testbeam (one at BTF is foreseen)
3. Some optimization may be needed: use of fast (> 1 GHz) amplifiers, NUV SiPMT arrays (instead of RGB ones) to better match scintillator emission

8. Some attention needed to CKOV gains and noise issues.