# A study of a Micromegas chamber in a neutron beam

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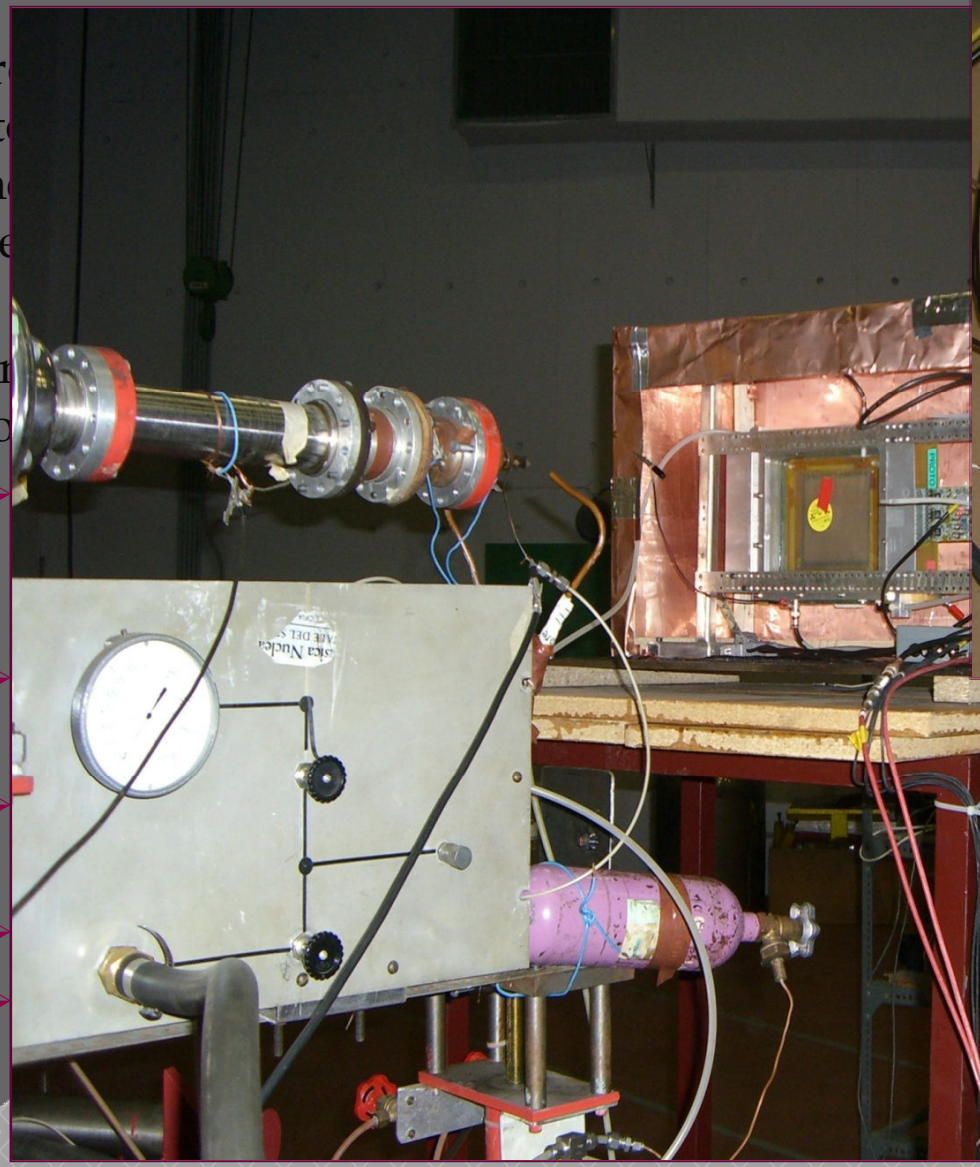
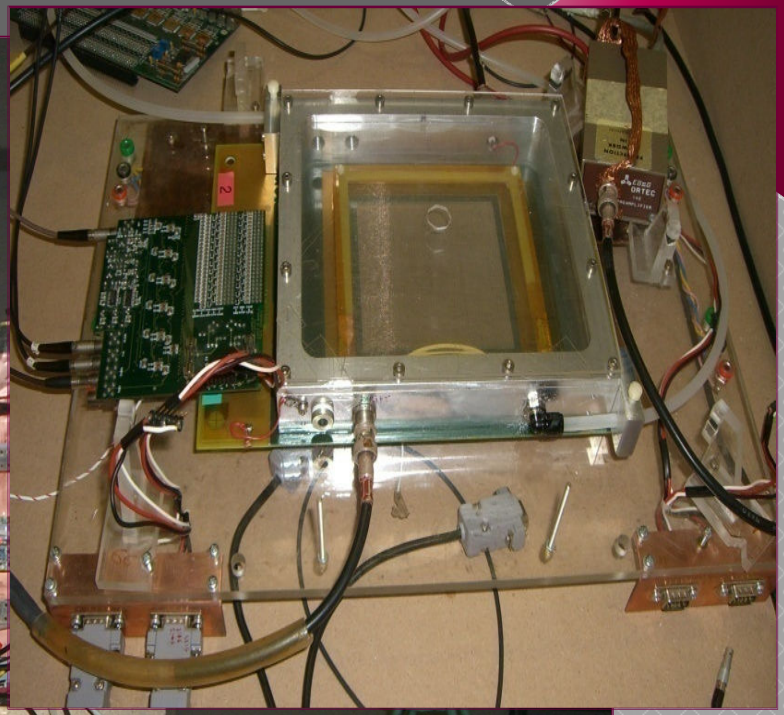
# Outline

- Test beam Set up
- Data acquisition System
- Data Monitoring
- Mesh Current Monitoring
- Beam profile (Number of neutrons vs time)
- Lifetime measurements
- Energy spectrum

# Test beam set up

- Micr
detect
hardn
good e
- R&D
trackin
enviro





| | |
|---|---|
| Strip length | cm |
| Strip pitch | m |
| Strip width | 0.9 mm |
| Amplification gap | um |
| Conversion region | m |

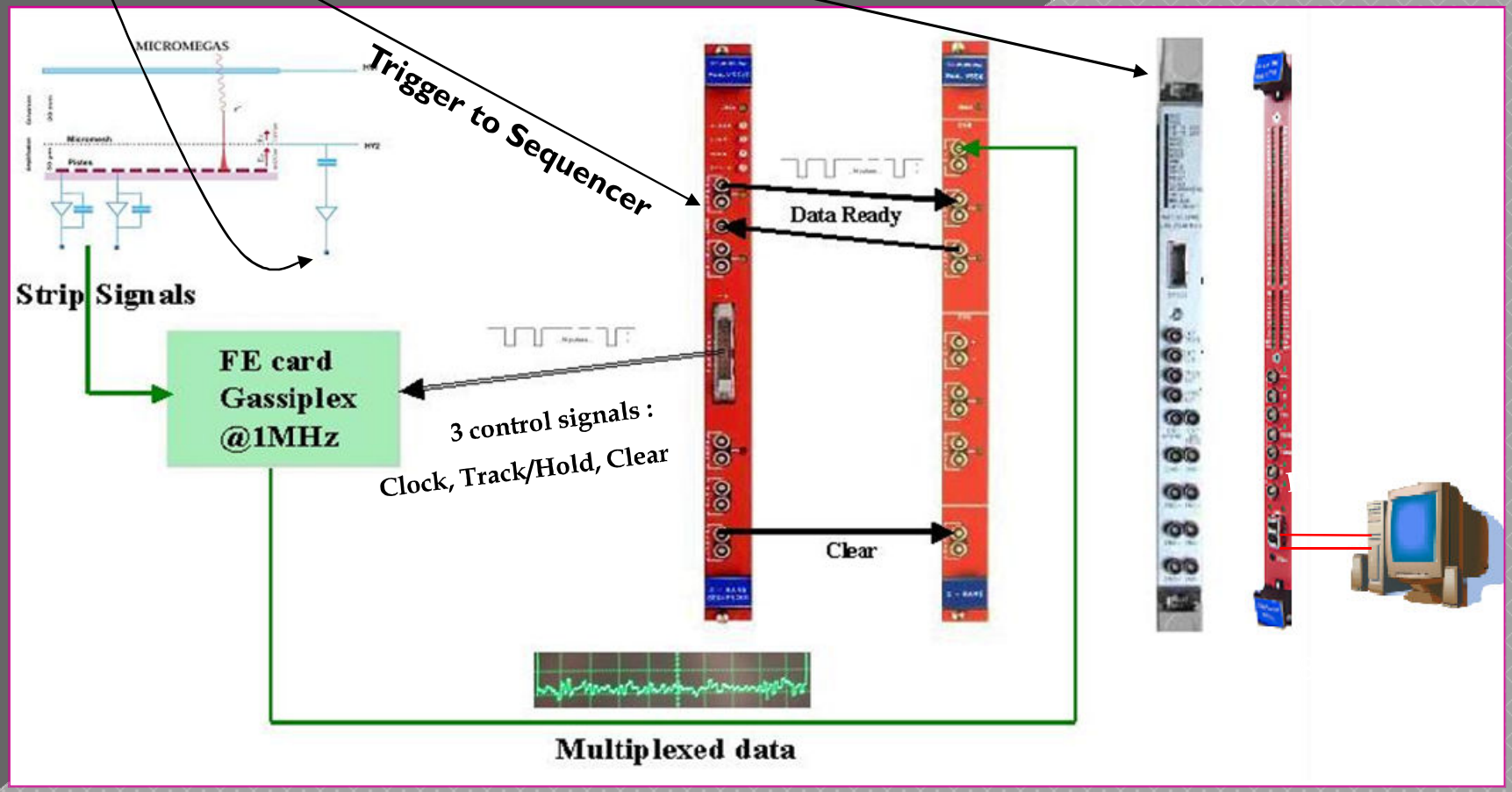
# Data Acquisition system

Preamplifier EG &G ORTEC 142

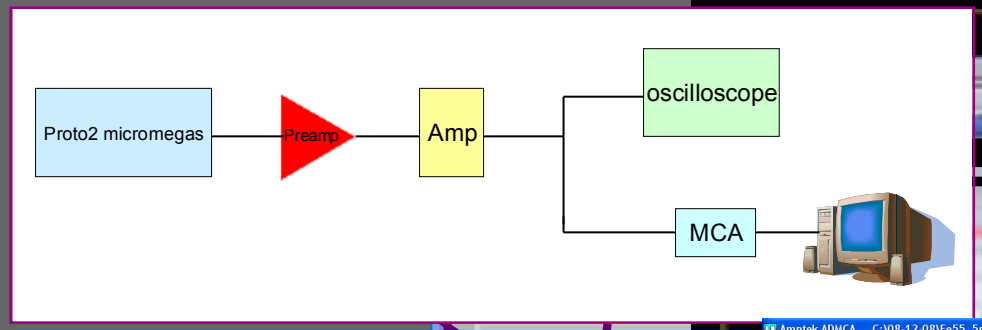
NIM Amplifier Shaper

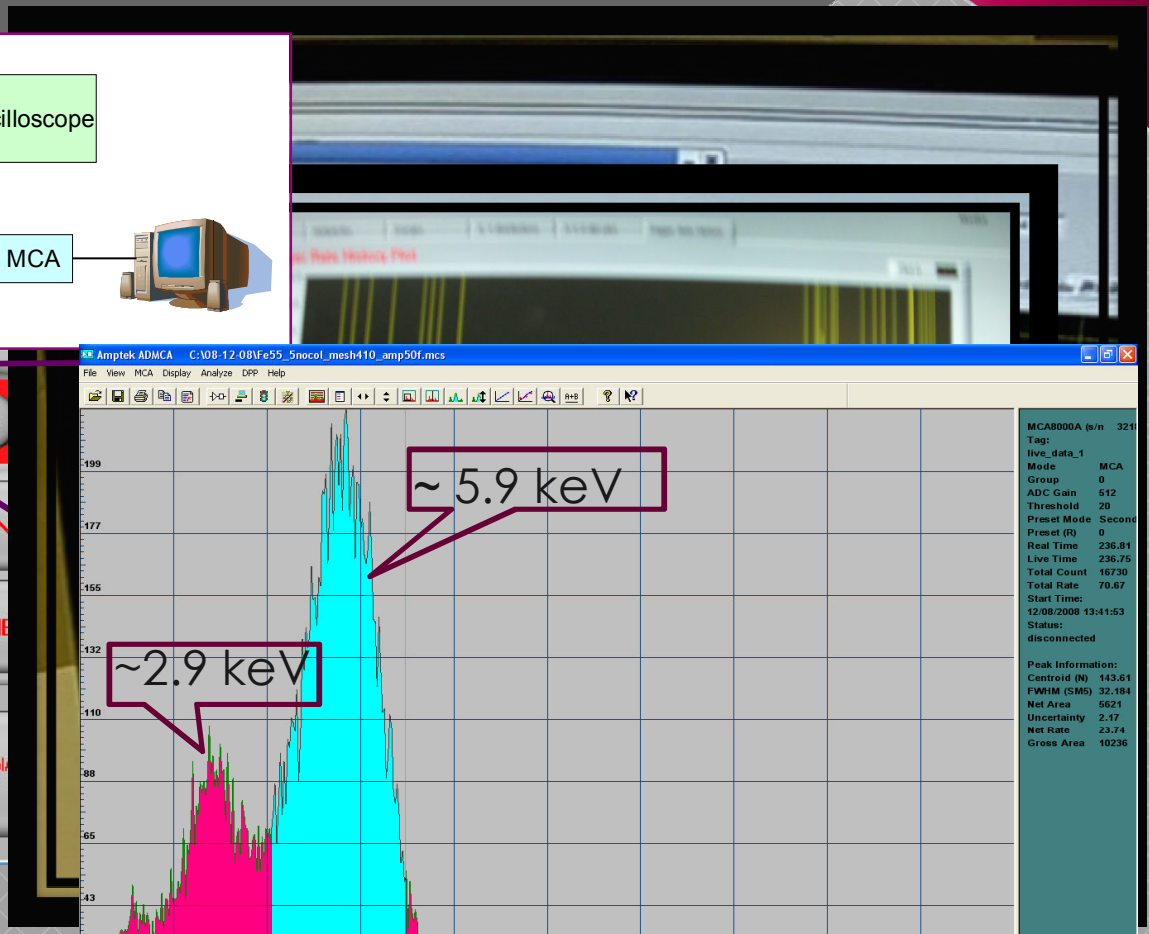
NIM Fan In-Fan Out

NIM Discriminator



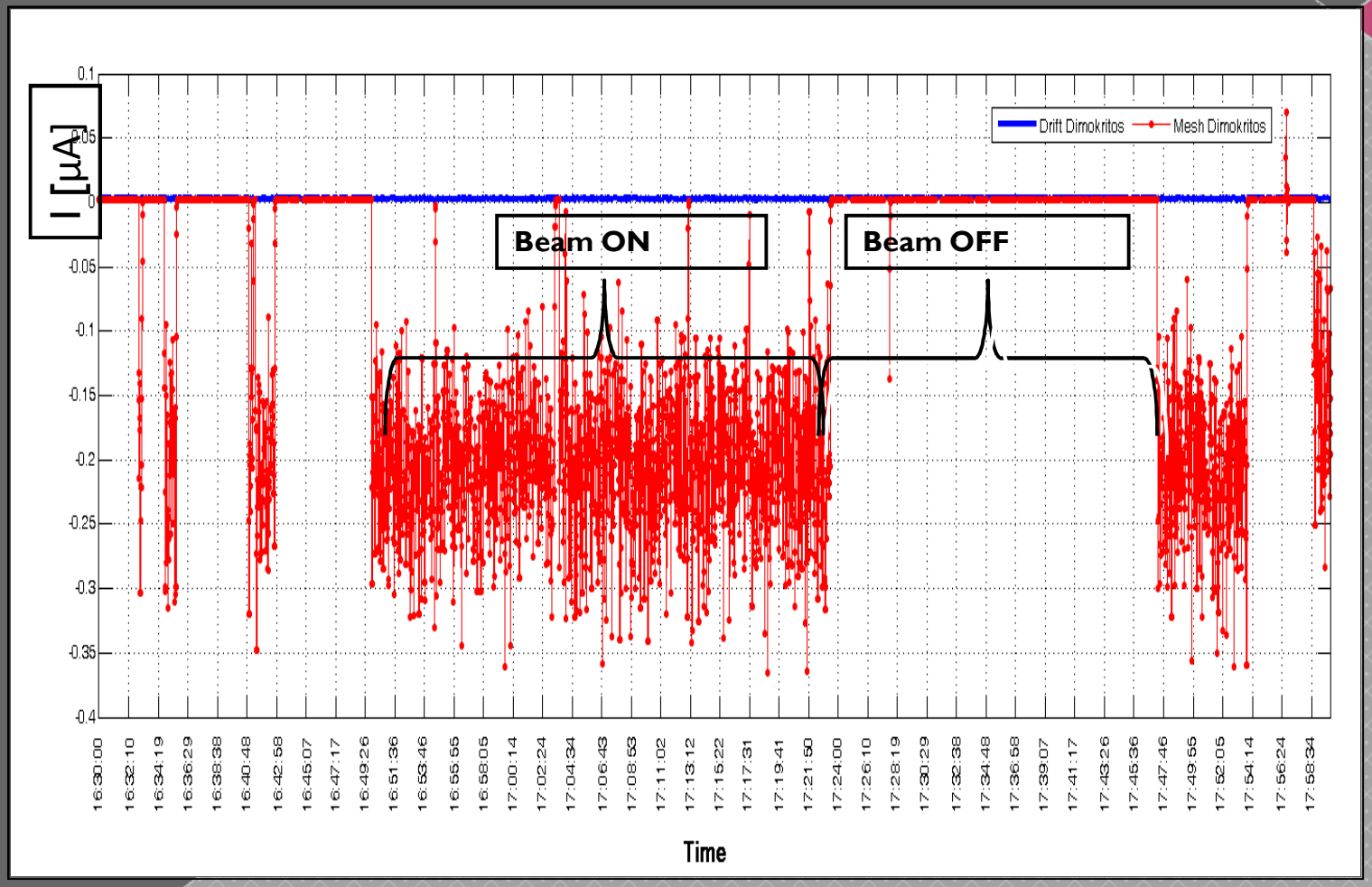
# Data Monitoring



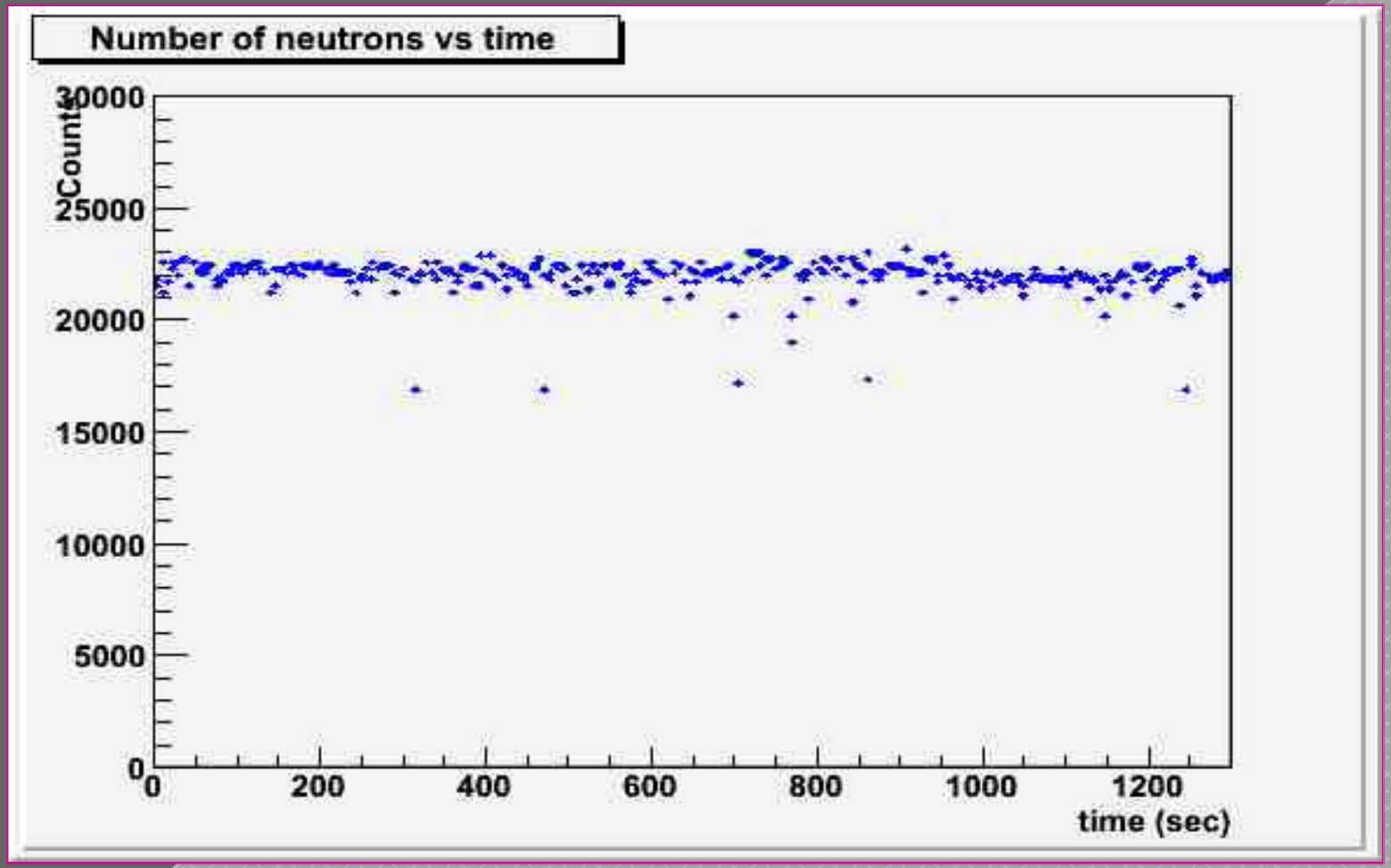

$^{55}Fe$ energy spectrum

# Mesh current Monitoring



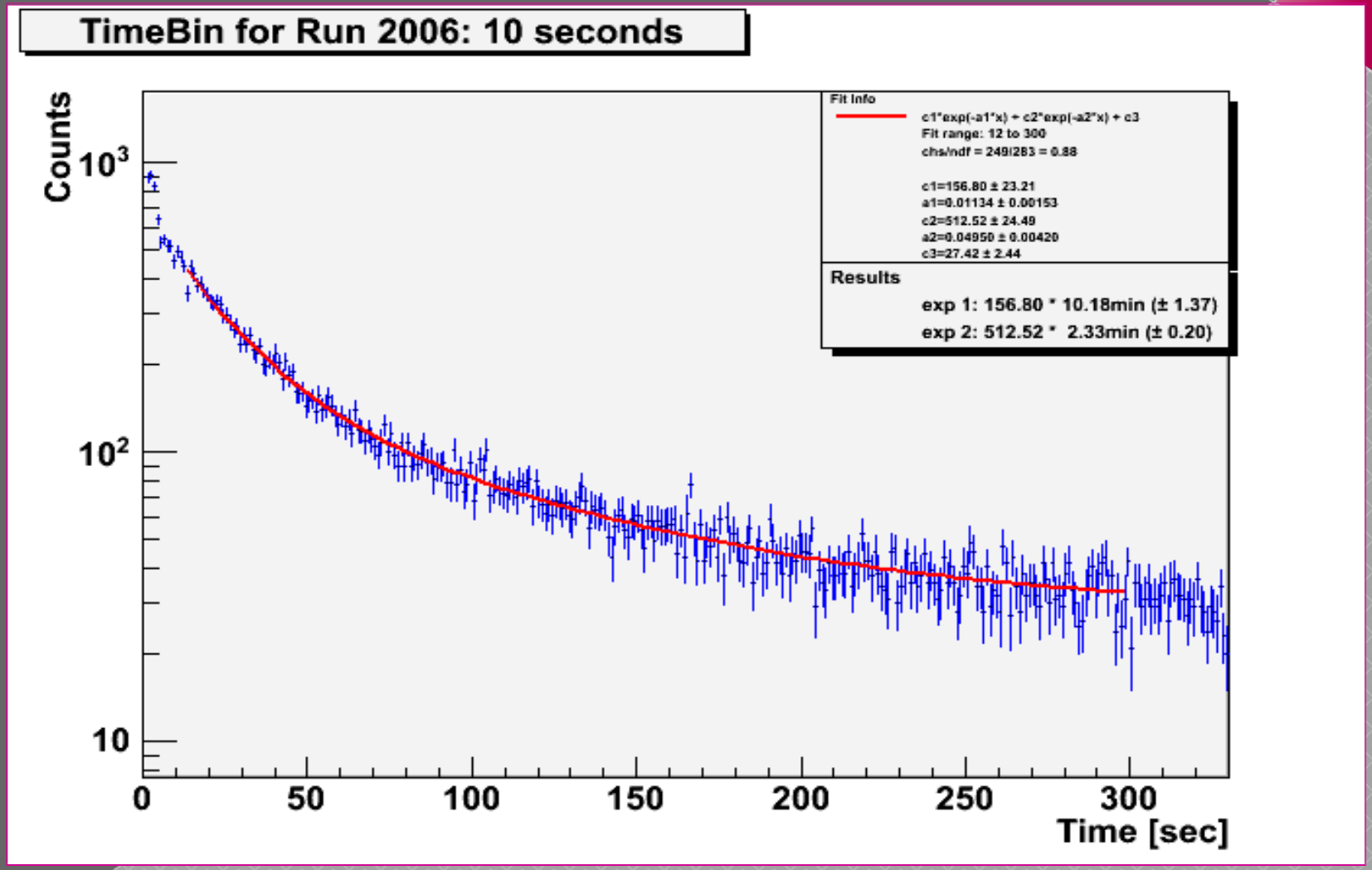

Neutrons interacting in the Micromegas chamber via very different processes (e.g. Elastic scattering with Ar, C etc) produce a high number of primary electrons that are amplified by a multiplication factor (Gain) of about 2000. The corresponding current, when the beam is on, is about 0.2 μA .

# Beam profile



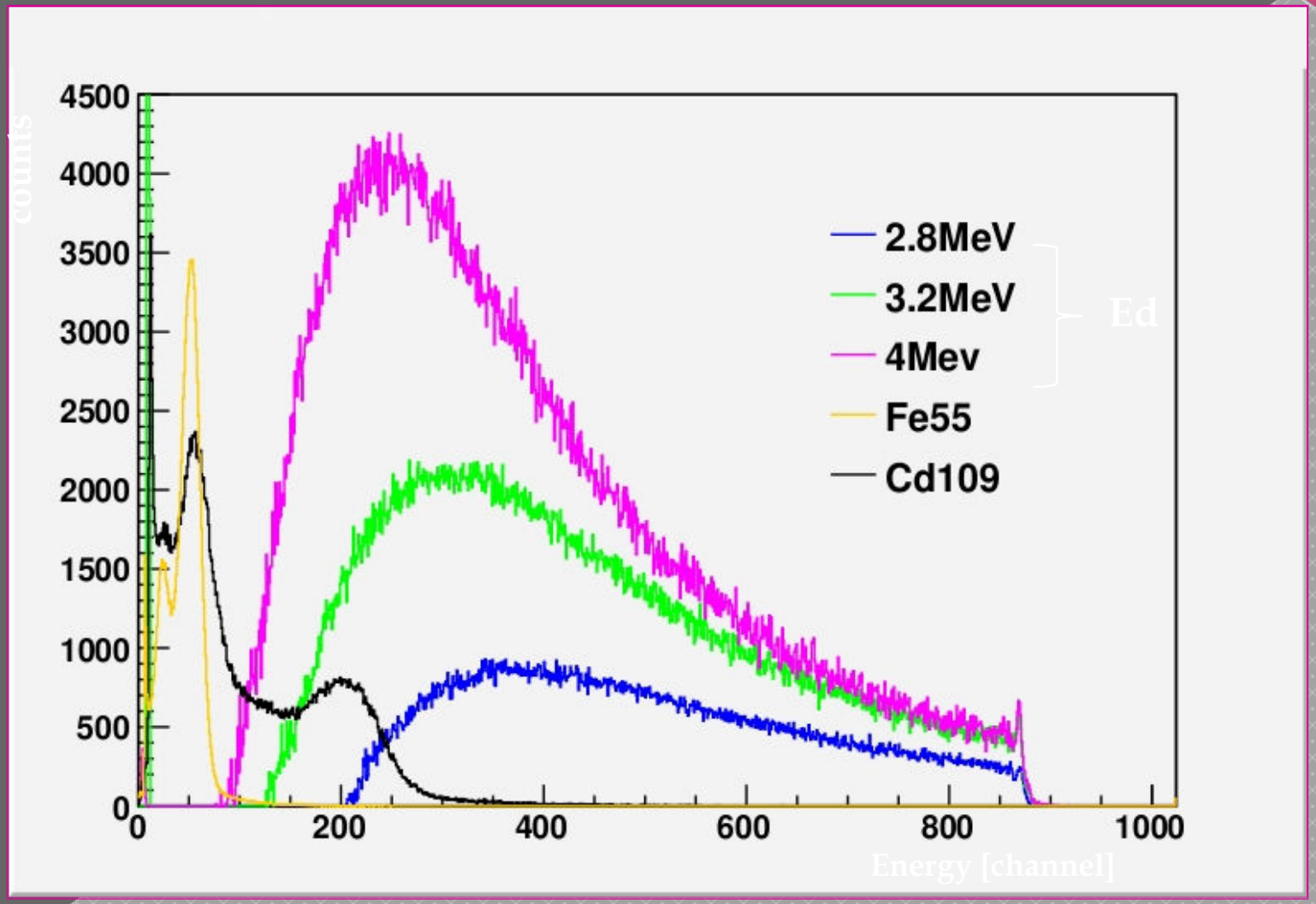

**Number of neutrons identified by a BF3 neutron counter**

# Lifetime measurement




- Lifetimes of :
  - $^{28}$Al (2.24 min)
  - $^{27}$Al(n,p)$^{27}$Mg (9.46 min)

# Energy spectrum




**The blue, green and violet histograms correspond to the net neutron contribution and the other histograms correspond to calibration with $^{55}$Fe and $^{109}$Cd**

# Thank you for your attention