Complementary equipment for luminosity measurement at OLYMPUS

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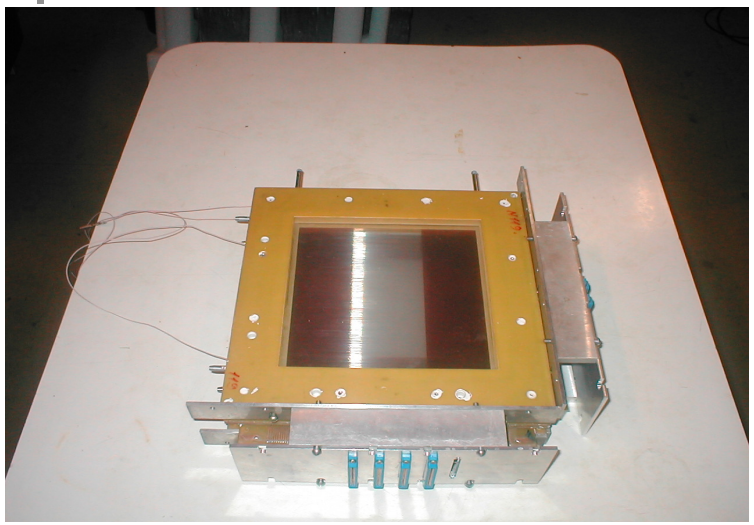
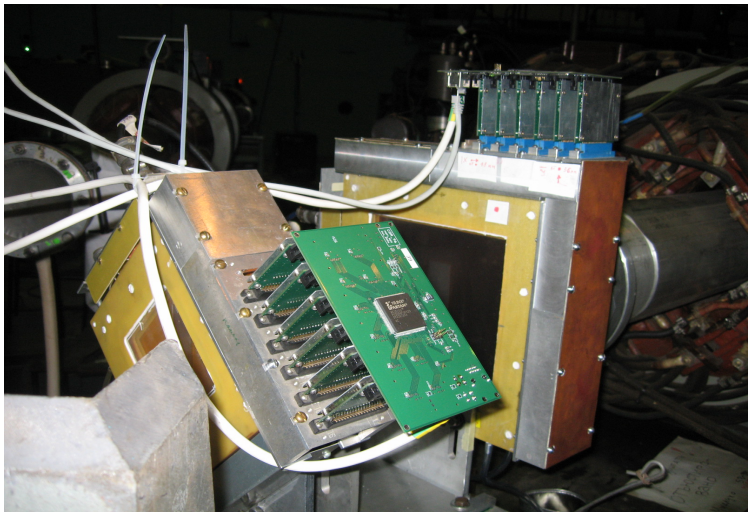
Considerations

- Luminosity measurement is crucial for OLYMPUS
- Installation of additional equipment for luminosity measurement is well in accordance with the PRC and Technical Review recommendations
- We have expertise in producing and operating the proposed equipment

MWPC modules with readout





- XY-planes in a single package
- 1mm anode wire spacing
- 2.5mm anode-cathode gap
- ~100x100mm^2 active area
- can sustain high rates

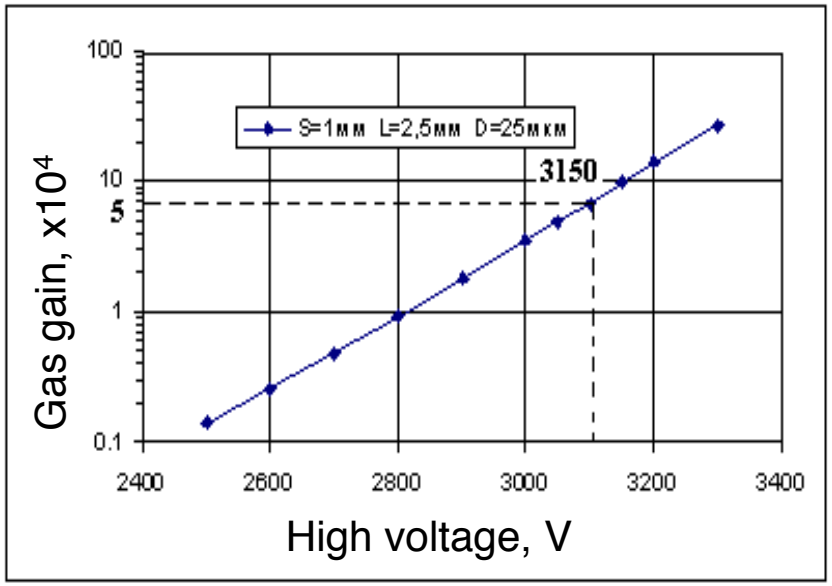
- PCOS4 readout:
  - VME back end, ~15μs dead time, multi-event buffering
  - fast cathode OR signal (trigger)
  - resistant to magnetic field and synchrotron radiation

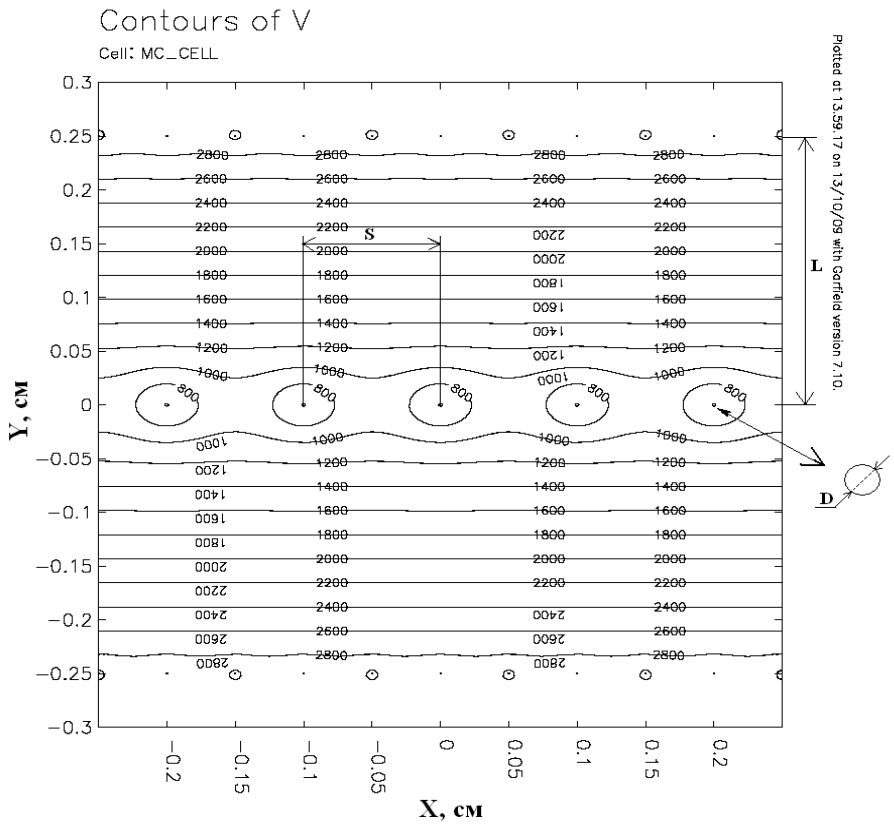
→ provided by Rome group

MWPC modules with readout, cont'd

- routinely produced at PNPI
- LV and gas system are available

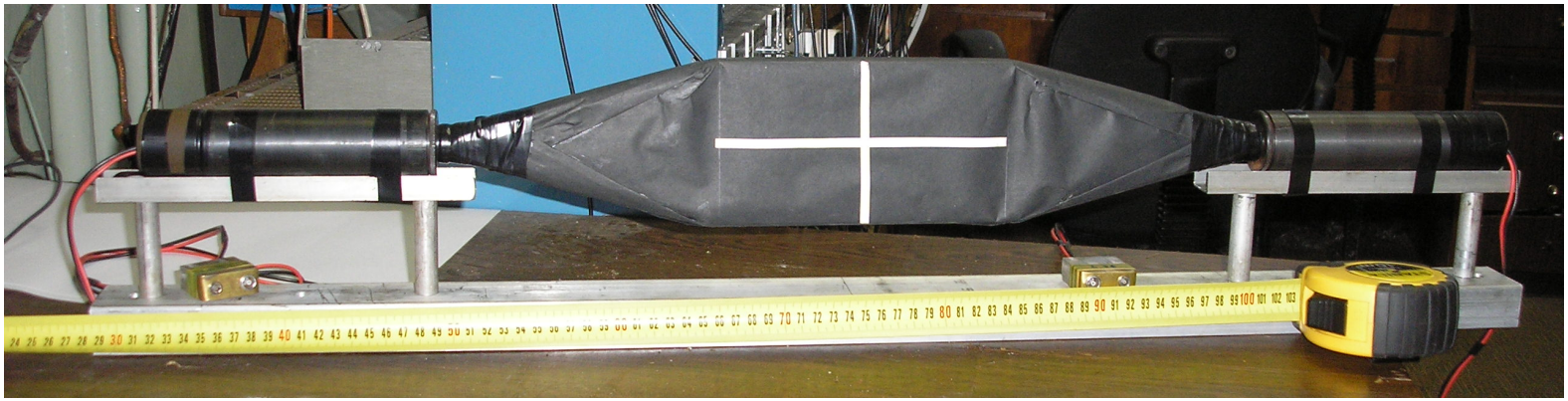
Ar(65%)+CO_2(30%)+CF_4(5%)





HV power supplies?

Scintillator assemblies with readout



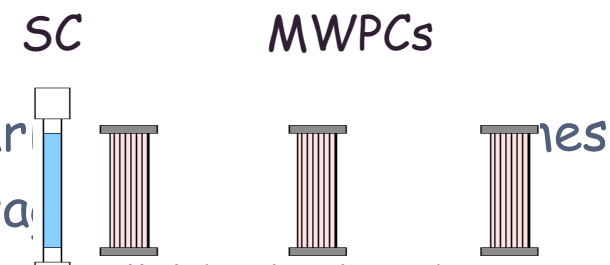
- BC-408 ~100x100x15mm^2
- Hamamatsu 1" R4998 PMTs
- relatively high rates possible
- (p,2p) experiment at PNPI:
  short lines + 623B LeCroy LEDs:
  <150ps timing resolution

- V775N CAEN TDC readout:
  - VME module, ~5μs dead time, multi-event buffering, block transfers

- magnetic field issue?
- HV power supplies?

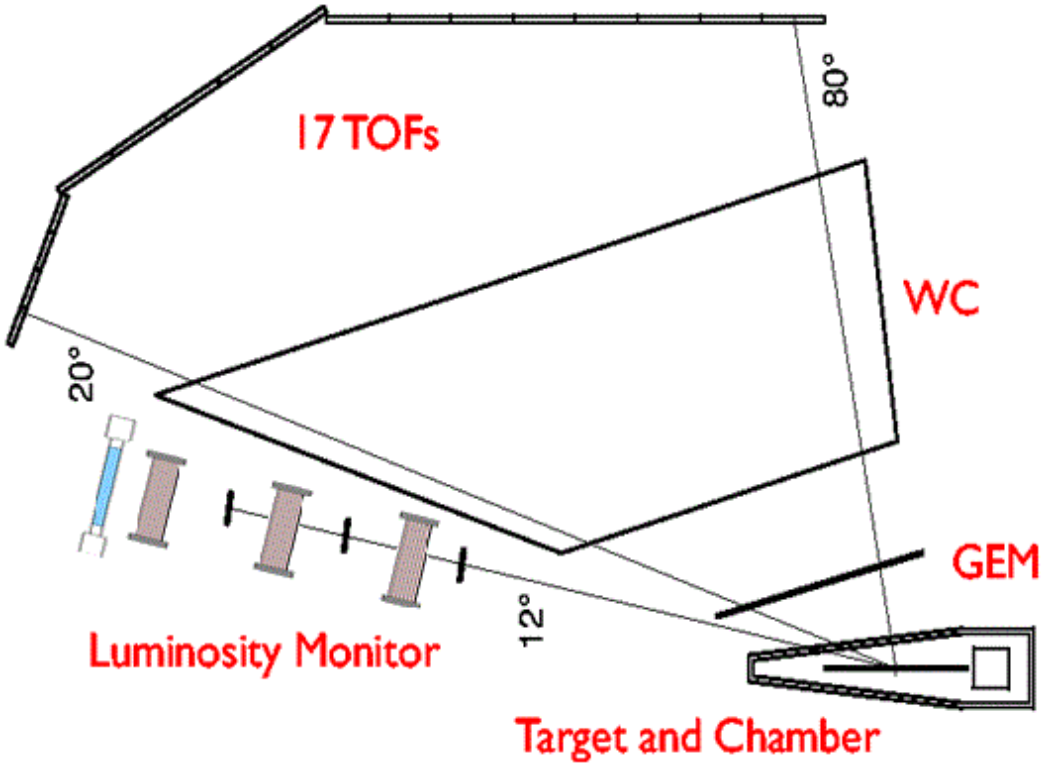
Configuration

2x telescopes at 12^0 (GEM acceptance):



- var[illegible]nes
- usa[illegible]
  - ~parallel (redundancy)
  - fall-back
  - GEM efficiency monitoring
  - timing (improve s/n ratio)
  - others?

Other installation options?



Cost estimate, availability, schedule

Proportional chambers	PNPI	~20k$	
PCOS4 readout	INFN	~40k$	available
LV, Gas system	INFN	~10k$	available

Scintillating counters	PNPI	~1k$	
R4998 PMTs	PNPI	~10k$	partly available
V775N TDC(s)	PNPI	~10k$	partly available

HV, cabling	?	?	
Support system	?	?	

Working prototypes: 2010, complete set: 2011

Summary

- PNPI can provide a complementary set of equipment for redundant luminosity measurement at OLYMPUS
- Once the configuration is fixed, a more detailed description with cost estimates, schedule, etc can be submitted to TDR shortly after this meeting