Lucite Hodoscope

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A- Cosmic Ray Test (cont'd)

2. TDC spectra
3. Position reconstruction
4. ADC histo.

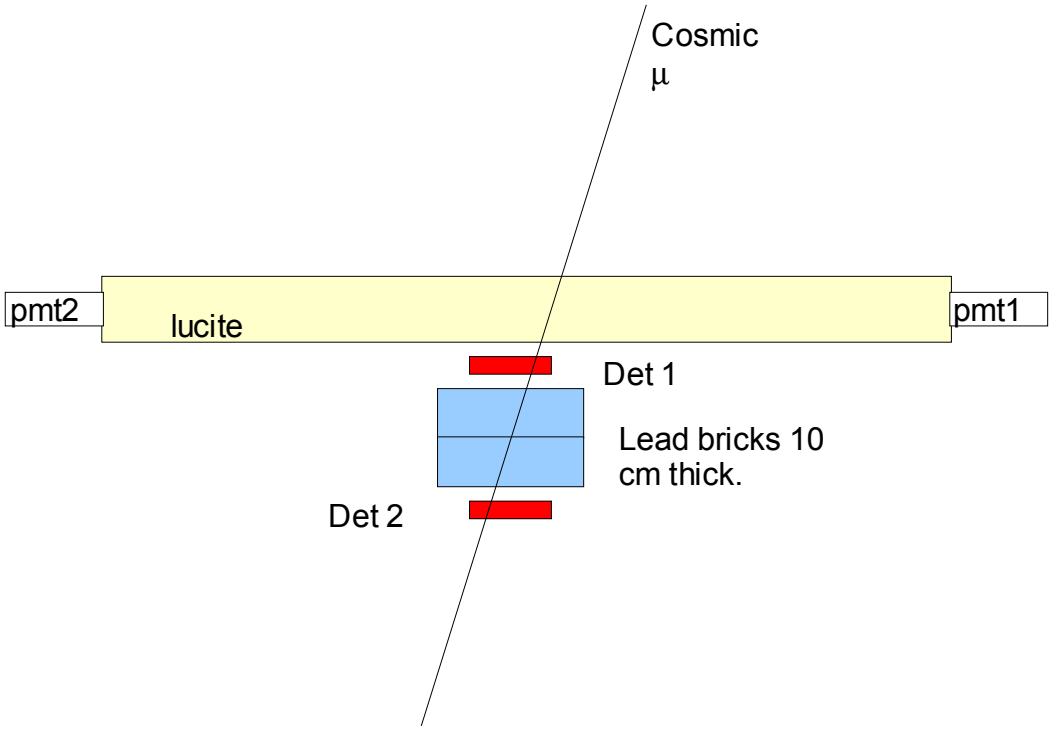
B- Orders

PMTs

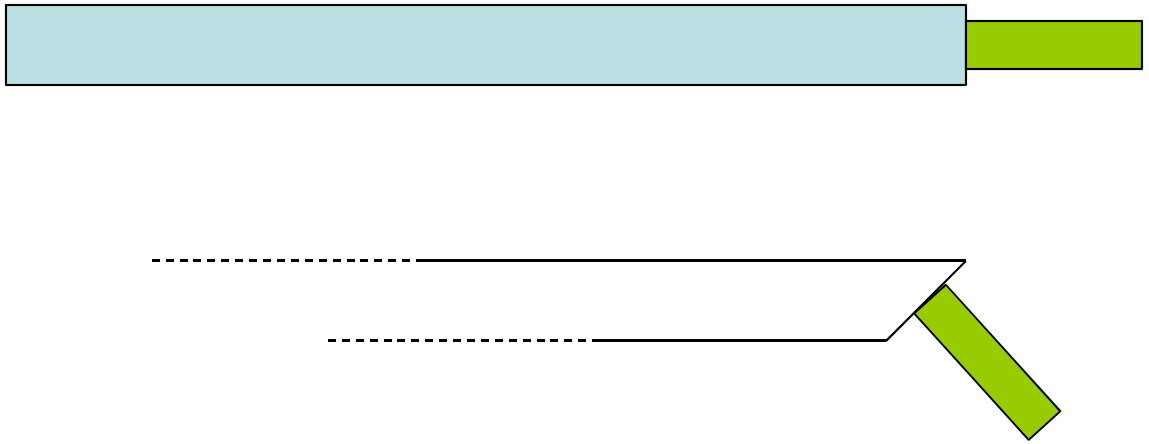
C- Beam Test Plans

10. Hall test
11. Parasitic test (SOS or HMS) (E05-017)

A- Cosmic Ray Test (cont'd)



Edge cuts



Use light guides ? → next step

Specs:

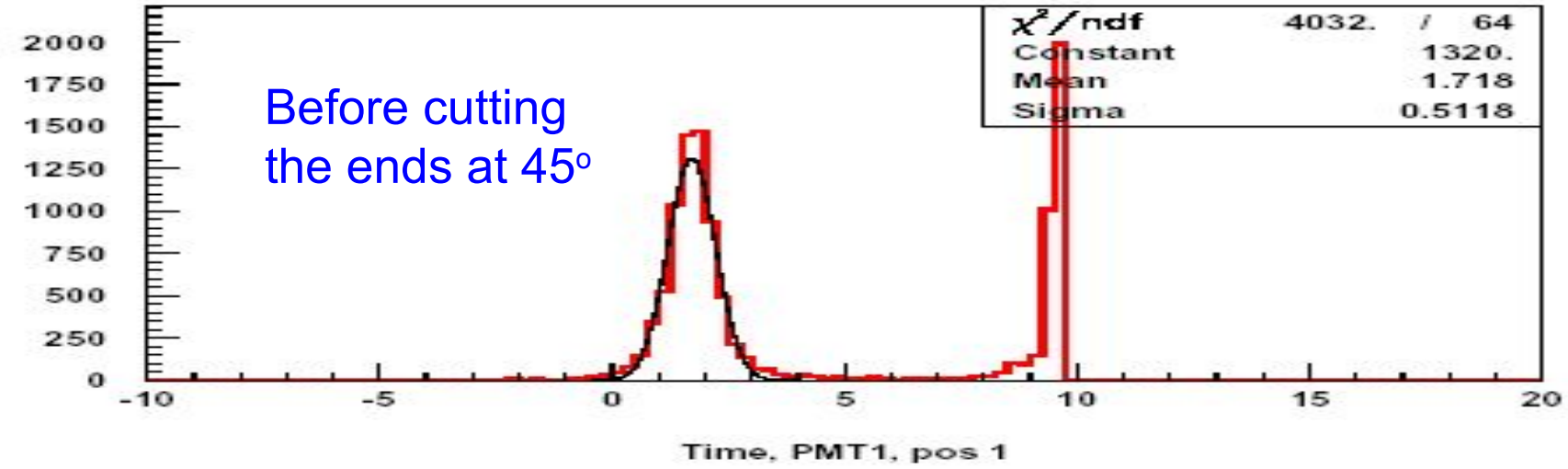
Lucite bar: 3.1 x 6 x 80 cm^3

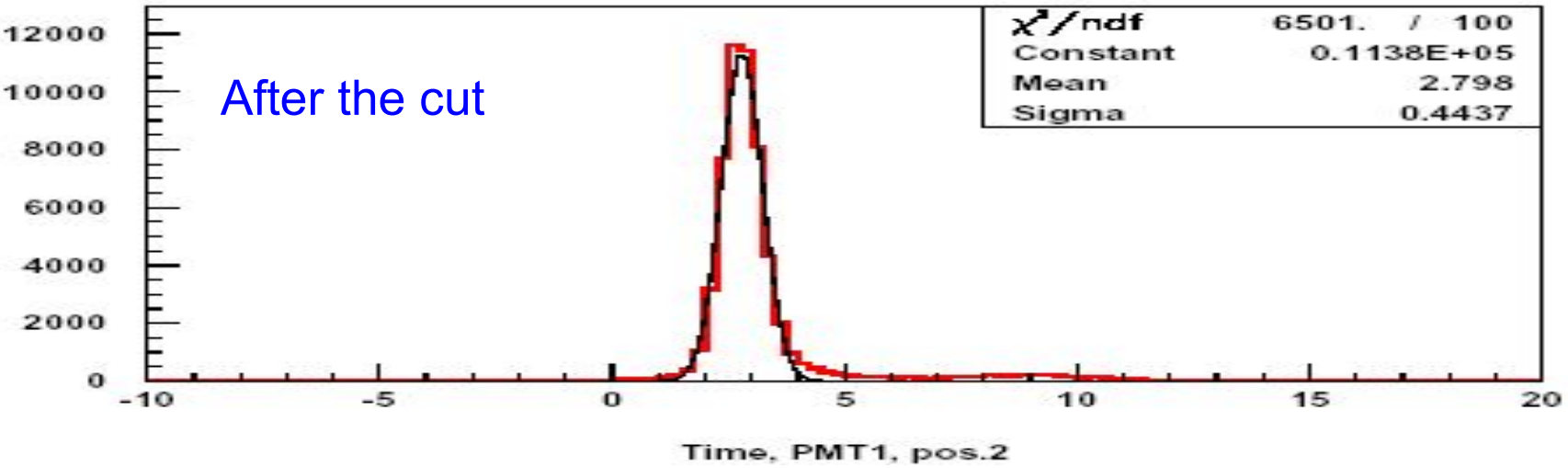
PMTs: Photonis xp2020 and Photonis xp2268

Det1 and Det2: 10 x 10 x 1 cm^3

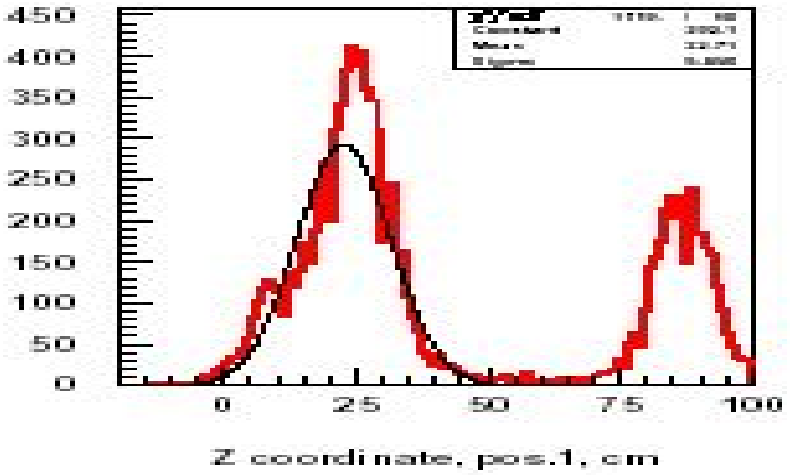
Lead bricks: T > 168 MeV

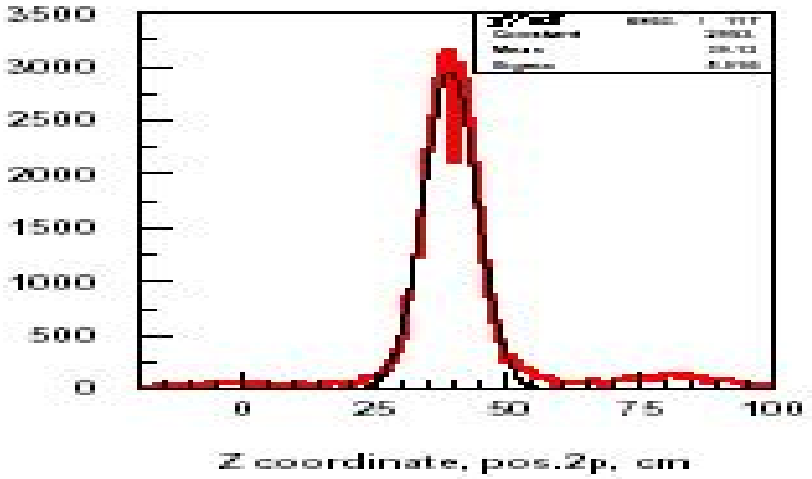
TDCs

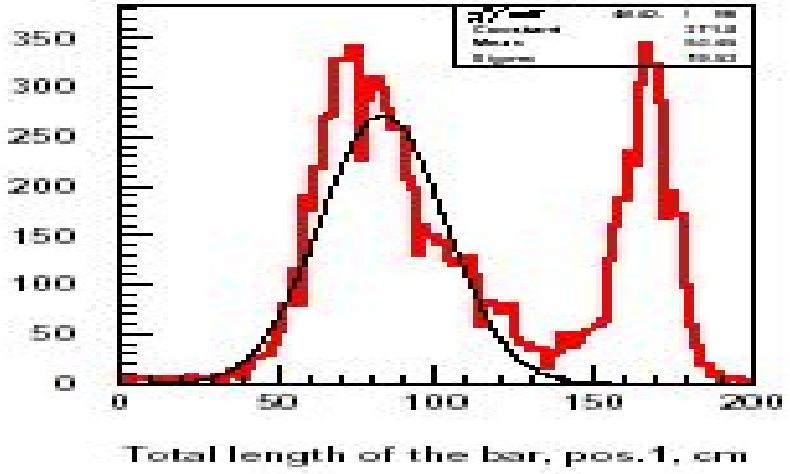

Before cutting
the ends at 45°
χ²/ndf 4032. / 64
Constant 1320.
Mean 1.718
Sigma 0.5118
2000
1750
1500
1250
1000
750
500
250
0
-10
-5
0
5
10
15
20
Time, PMT1, pos 1

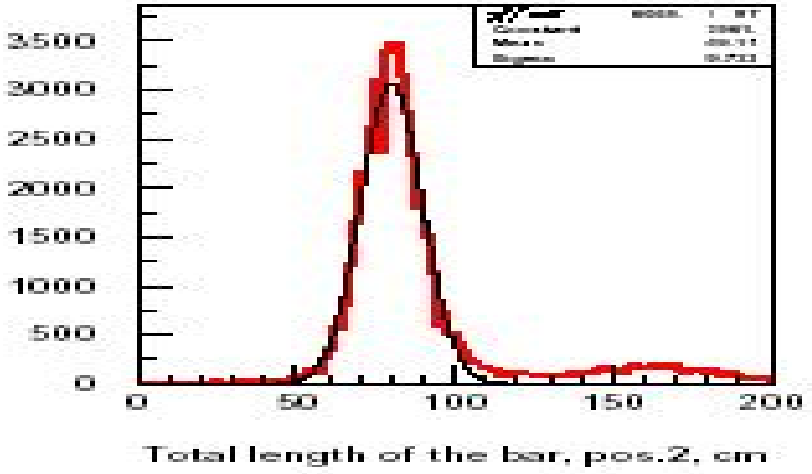

After the cut
χ²/ndf 6501. / 100
Constant 0.1138E+05
Mean 2.798
Sigma 0.4437
12000
10000
8000
6000
4000
2000
0
-10
-5
0
5
10
15
20
Time, PMT1, pos.2

Coordinate reconstruction

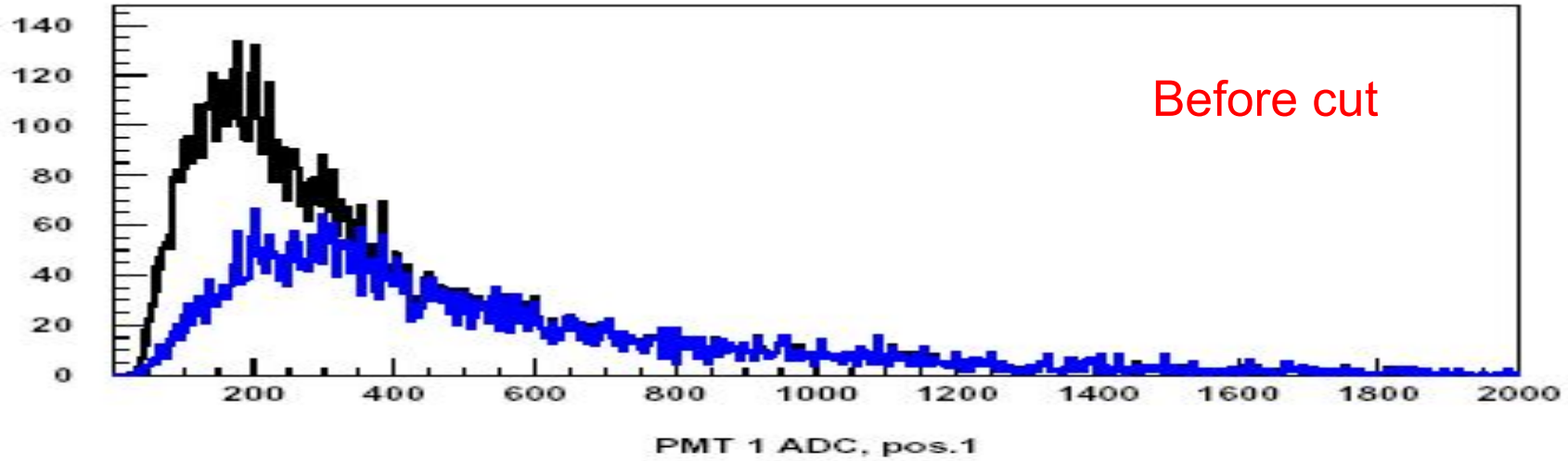


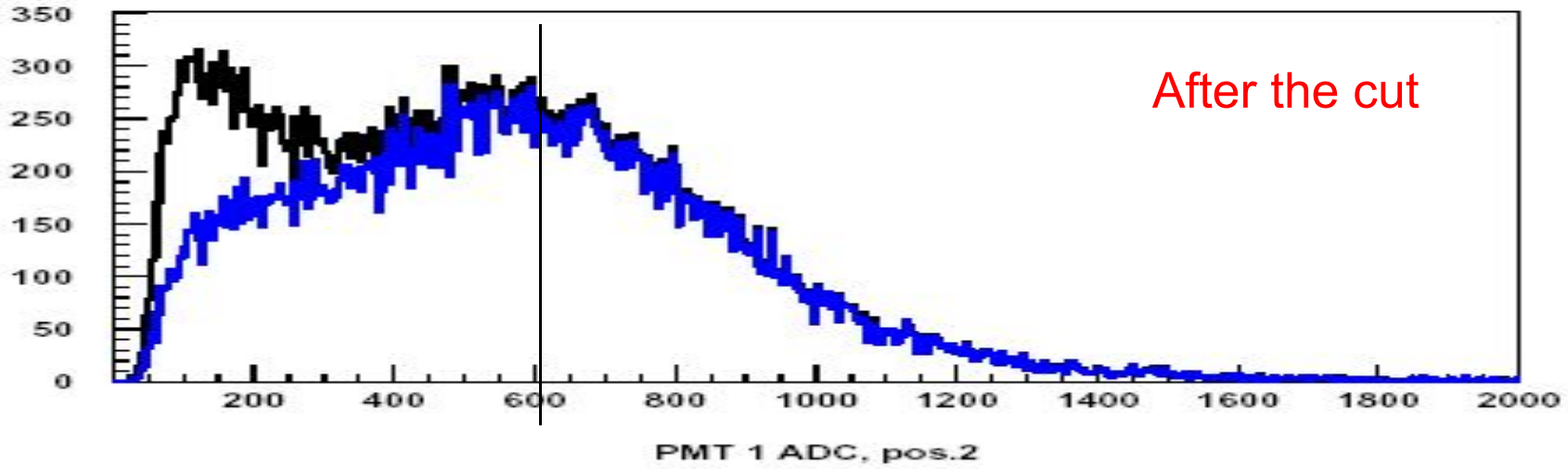




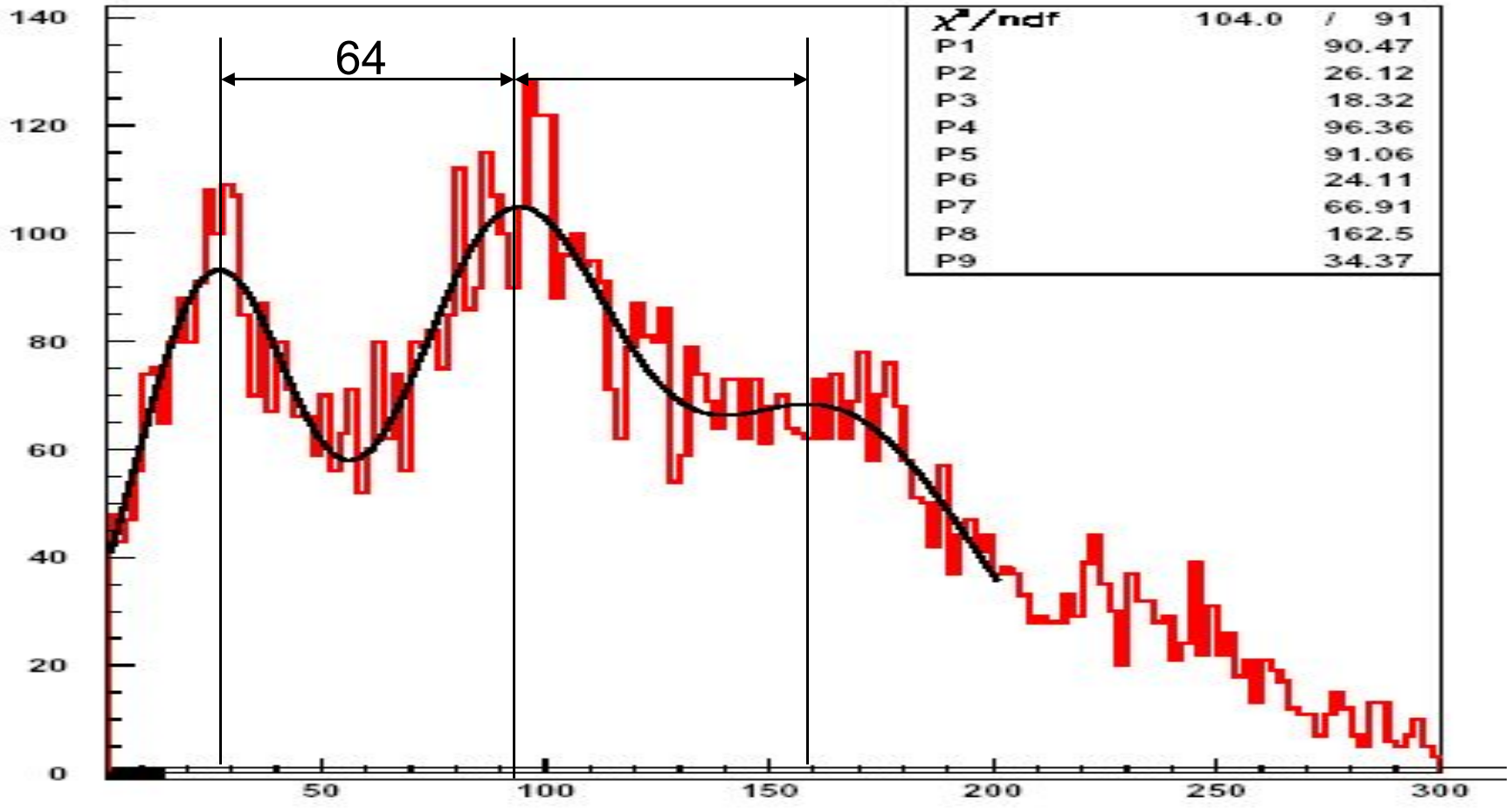


ADC spectra


140
120
100
80
60
40
20
0
200
400
600
800
1000
1200
1400
1600
1800
2000
PMT 1 ADC, pos.1
Before cut


350
300
250
200
150
100
50
0
200
400
600
800
1000
1200
1400
1600
1800
2000
PMT 1 ADC, pos.2
After the cut

ADC spectra


64
χ²/ndf 104.0 / 91
P1 90.47
P2 26.12
P3 18.32
P4 96.36
P5 91.06
P6 24.11
P7 66.91
P8 162.5
P9 34.37
140
120
100
80
60
40
20
0
50
100
150
200
250
300

Results

- Number of photoelectrons= ~10

- Coordinate resolution 0.75 – better 1.6 cm
  vs. 1.5 – 3.3 cm

Orders…

- 32 PMTs Photonis xp2020
- Access to a large number of SOS photonis xp2268 PMTs
- Order the bars after beam test
- Start assembly by summer 2007

To investigate:

- Use of light guides
- Curving the bars

Beam Test Plans

Test 1:

Set up the prototype in hall C

Two narrow scintillators at 40 deg.

1. Study the background conditions
2. Coordinate resolution
3. Detector efficiency at high rates

Test 2: Parasitic run with E05-017

Set up the detector behind the SOS chambers or in front of the HMS calorimeter.

6. Measure the detector efficiency
7. Measure the coordinate resolution
8. Dependence on:
   - -momentum
   - -angle of incidence
   - -position