# HMS/SOS Hodoscope Status

## (HMS Scintillator Test Measurements)

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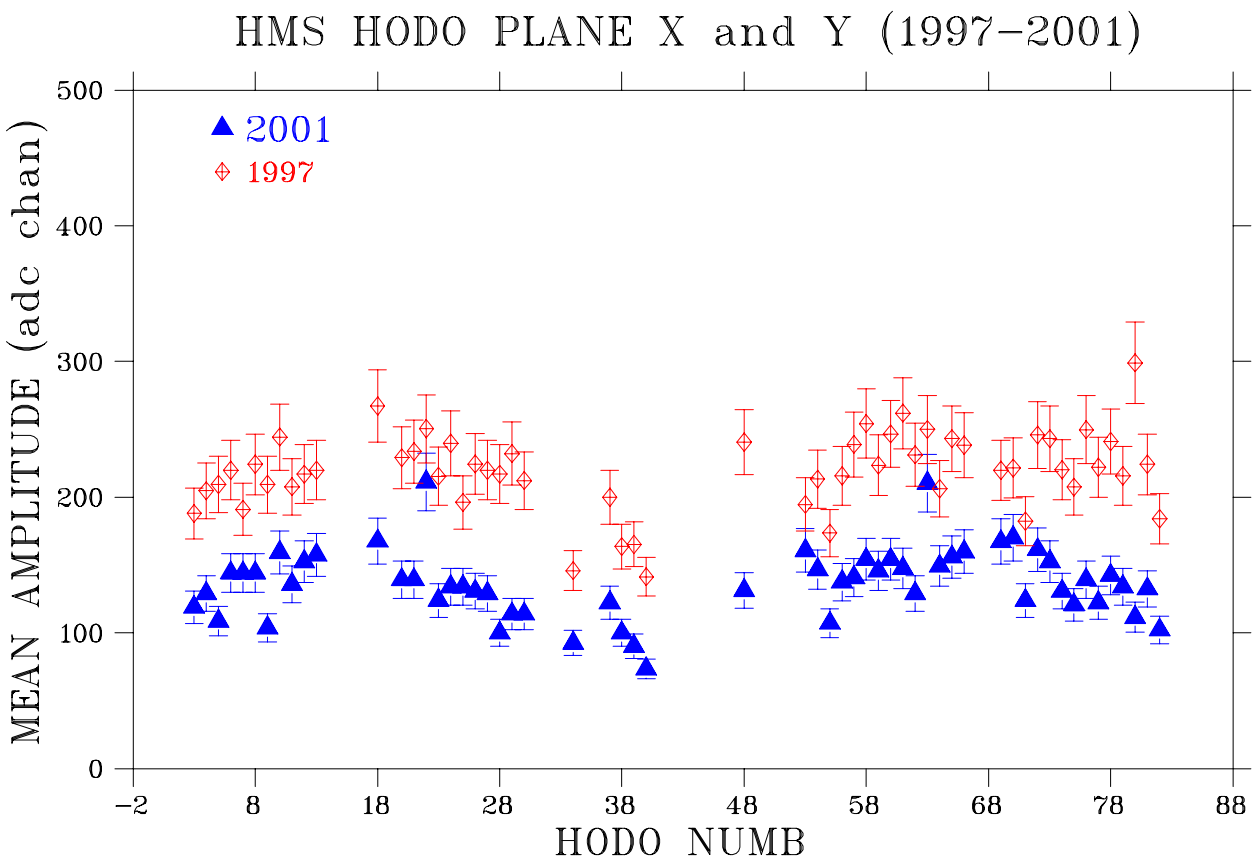
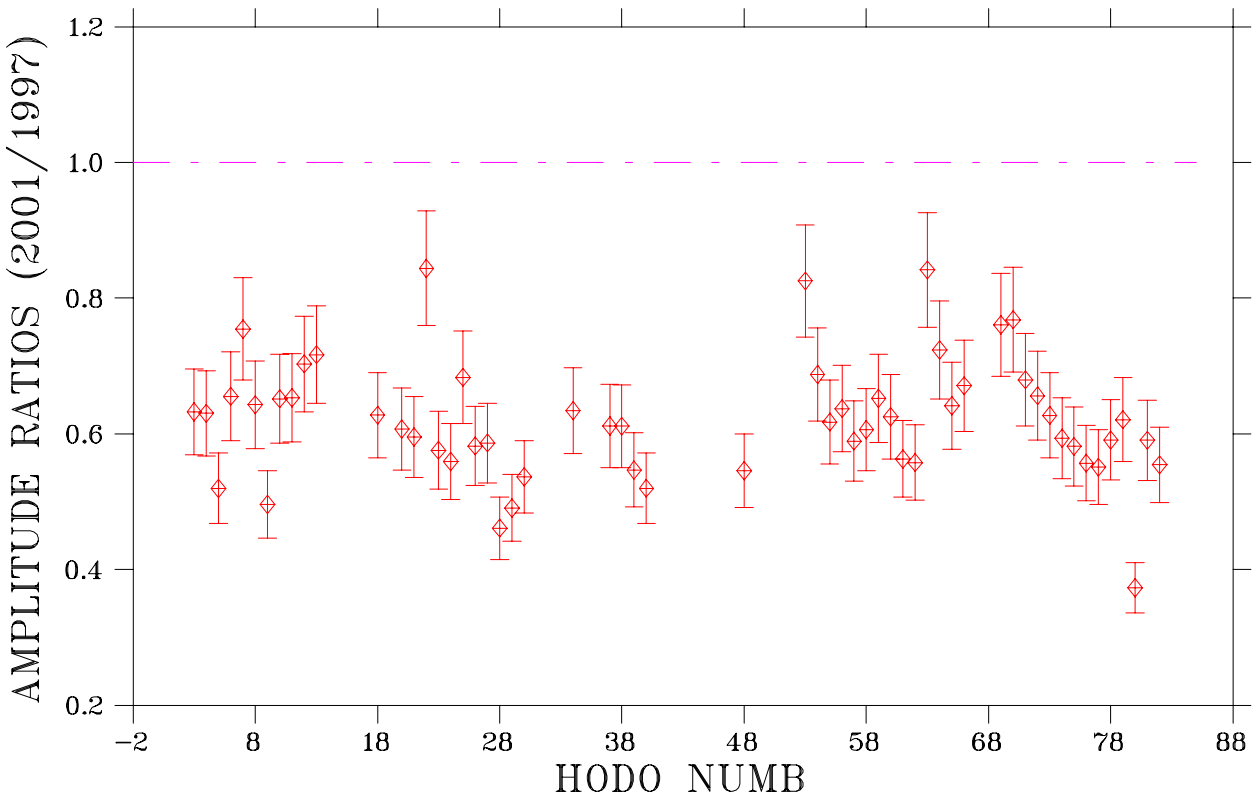
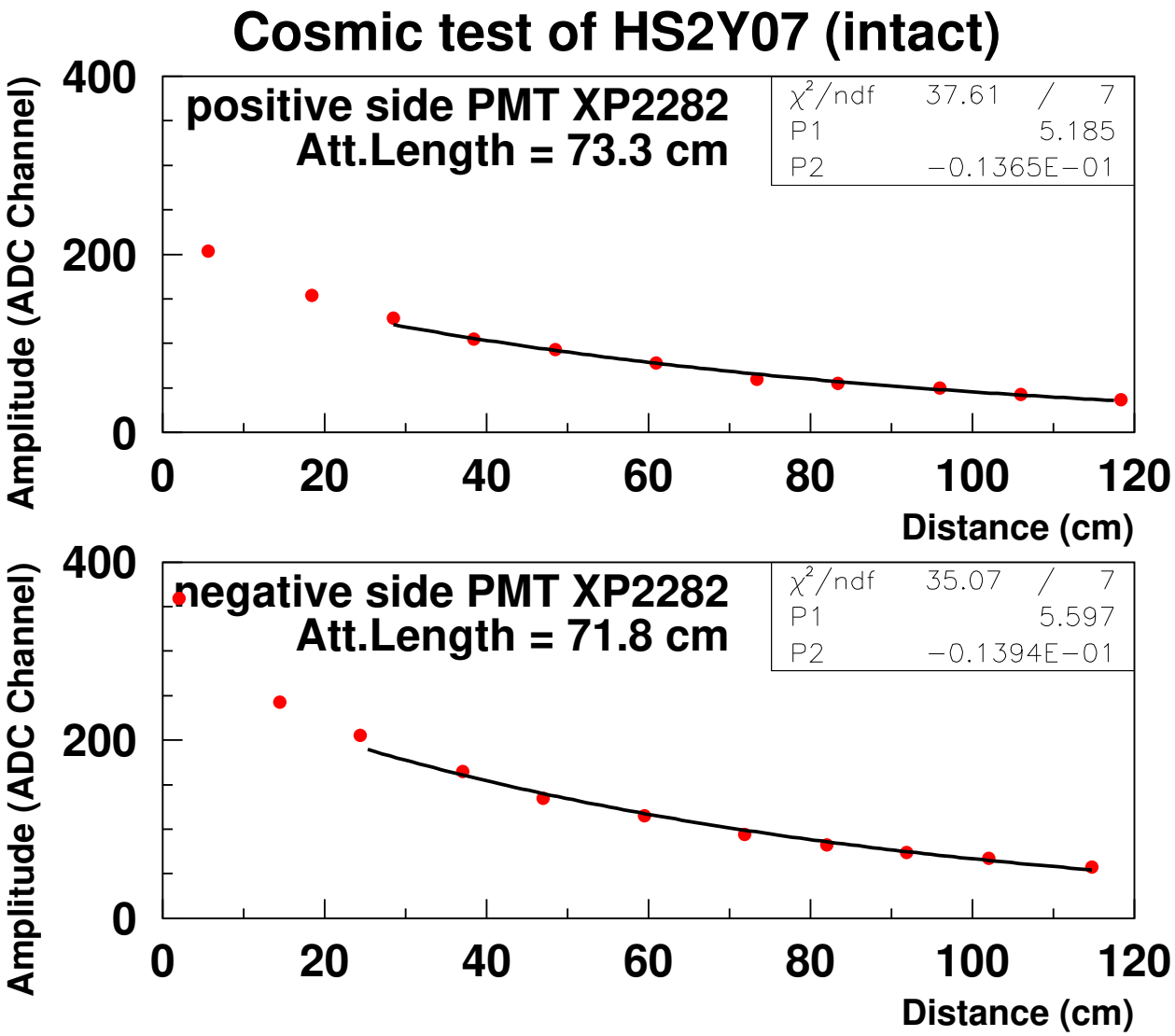
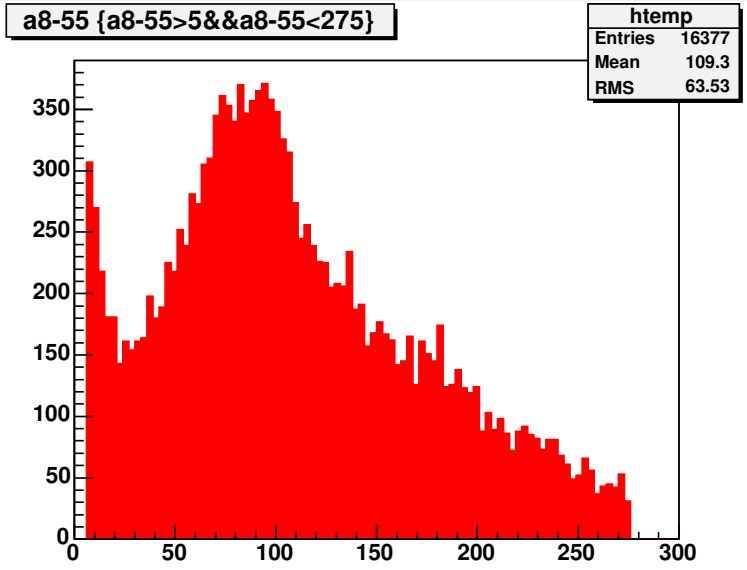
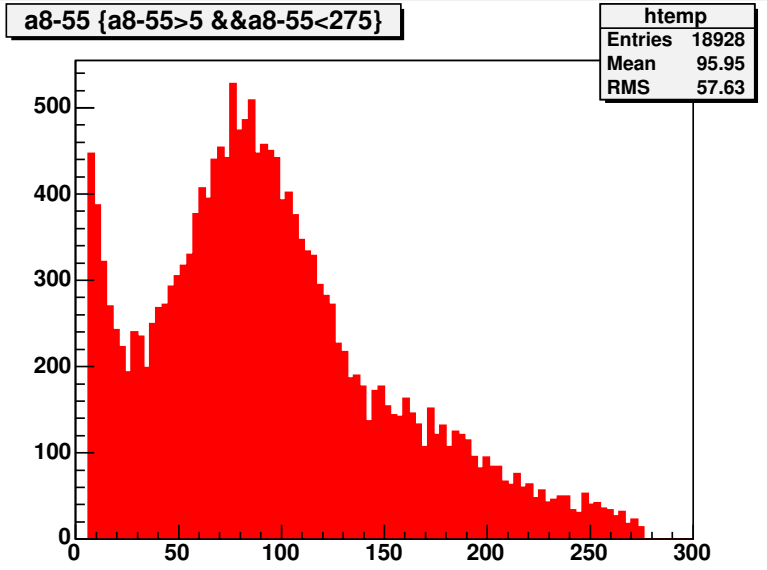
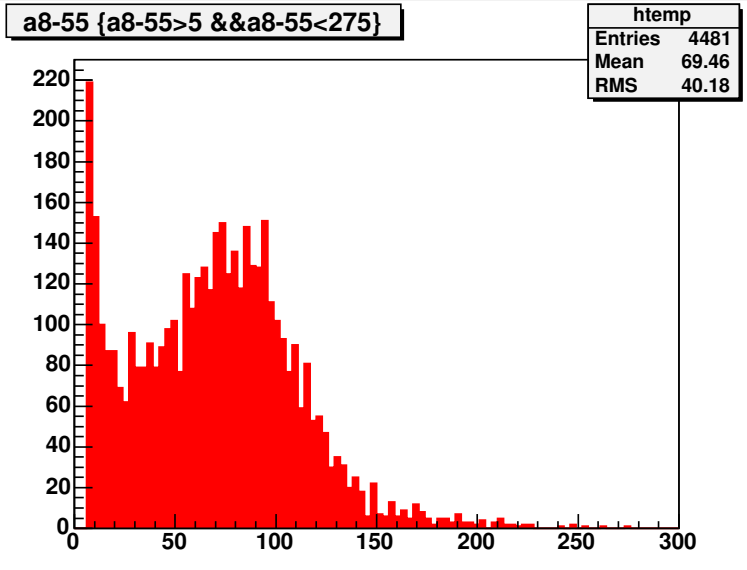

HMS HODO PLANE X and Y (1997–2001)
2001
1997
MEAN AMPLITUDE (adc chan)
HODO NUMB

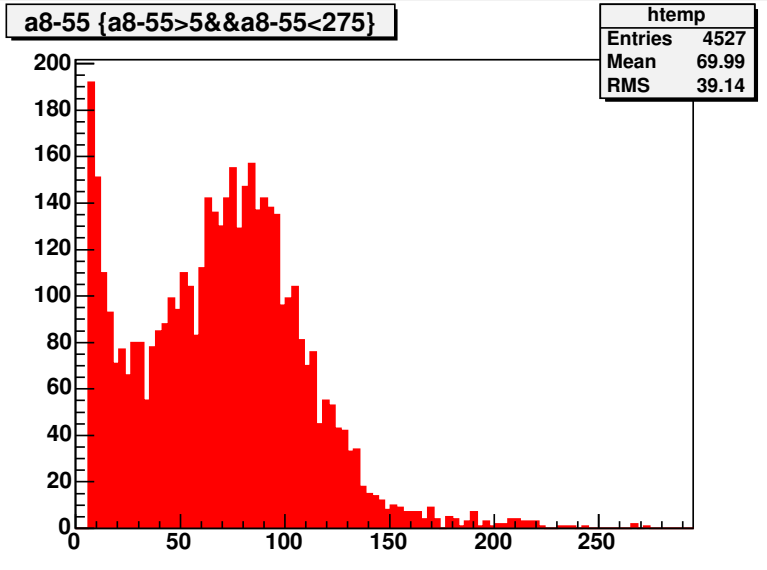

AMPLITUDE RATIOS (2001/1997)
HODO NUMB

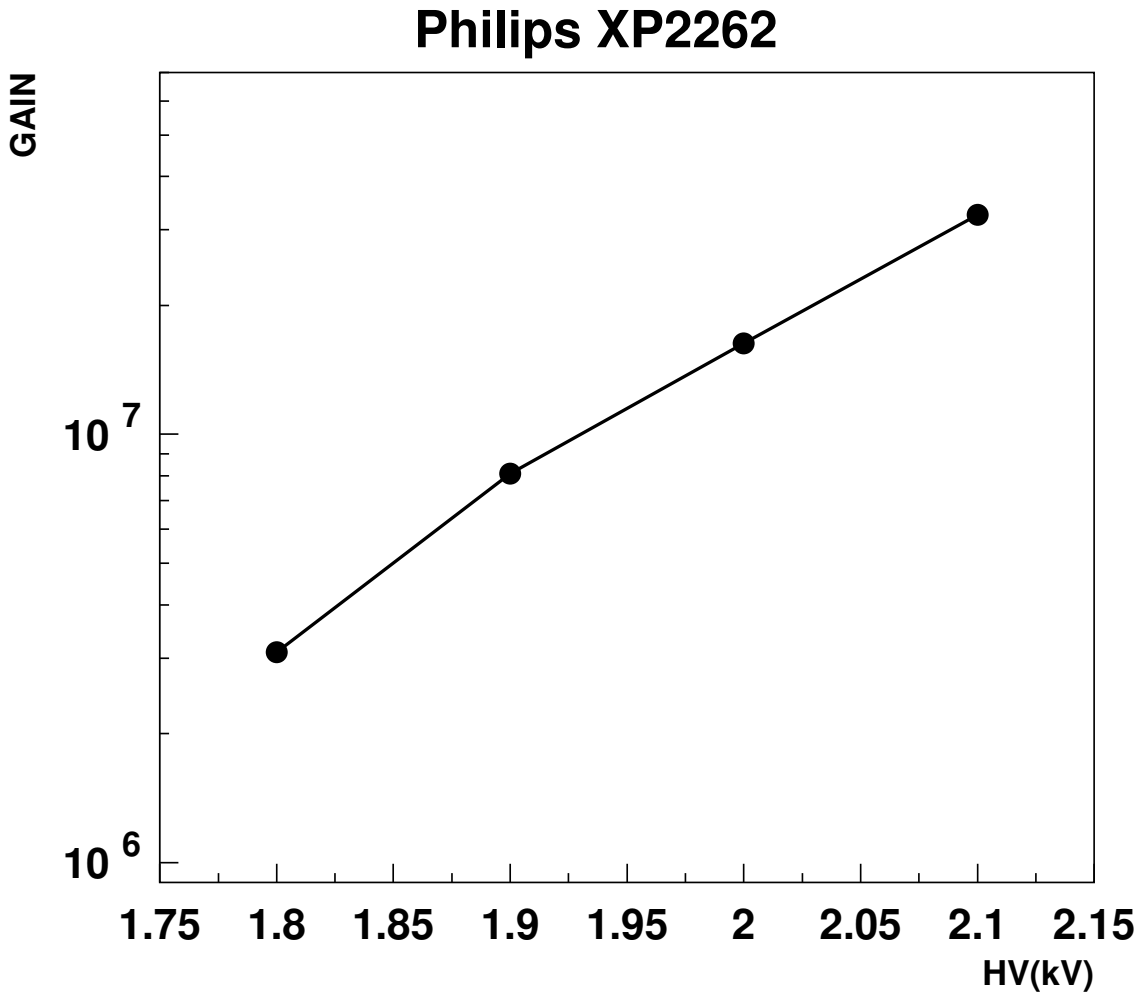

Cosmic test of HS2Y07 (intact)
positive side PMT XP2282
Att.Length = 73.3 cm
χ²/ndf 37.61 / 7
P1 5.185
P2 −0.1365E−01
Amplitude (ADC Channel)
Distance (cm)
negative side PMT XP2282
Att.Length = 71.8 cm
χ²/ndf 35.07 / 7
P1 5.597
P2 −0.1394E−01
Amplitude (ADC Channel)
Distance (cm)

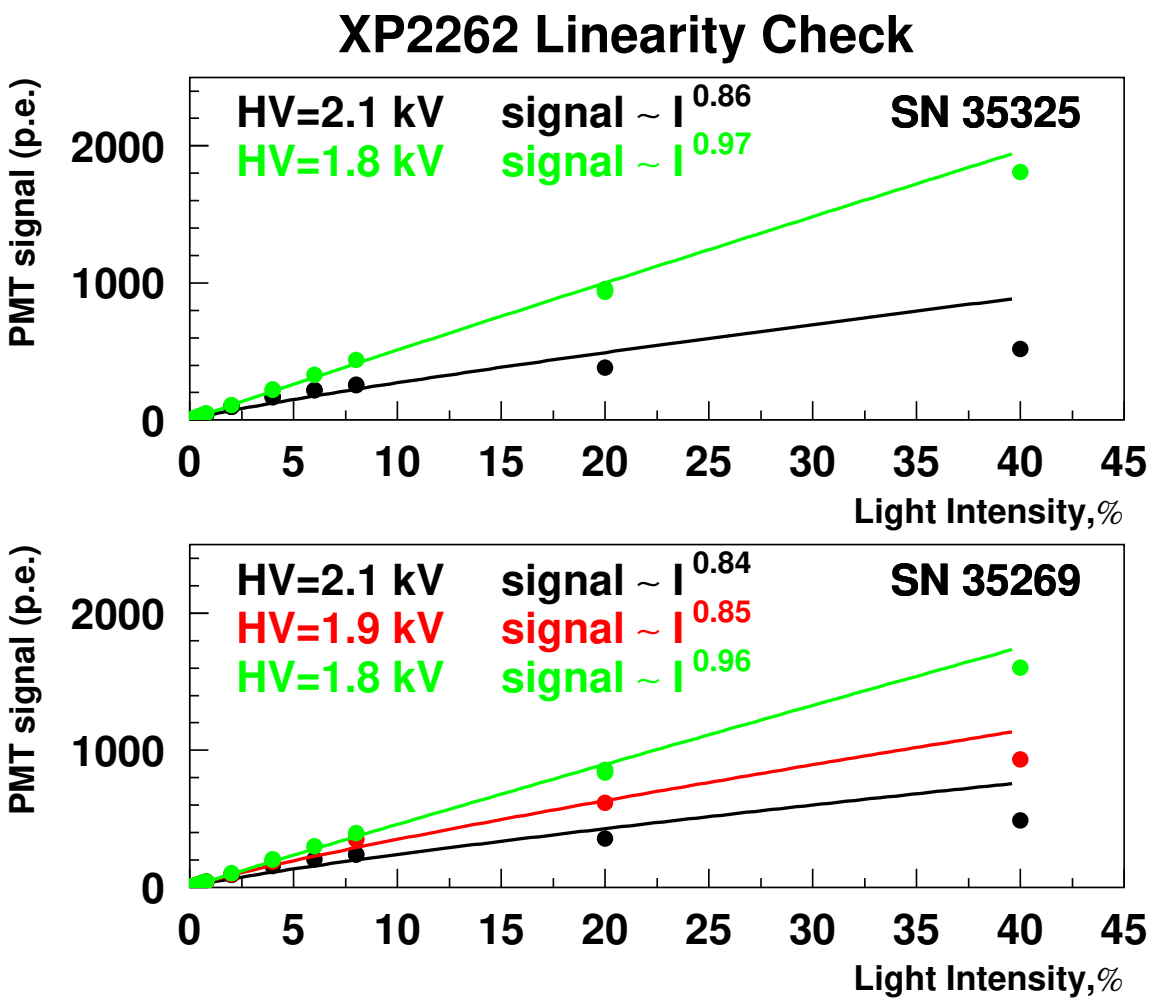

a8-55 {a8-55>5&&a8-55<275}
htemp
Entries 16377
Mean 109.3
RMS 63.53
0 50 100 150 200 250 300
0 50 100 150 200 250 300 350

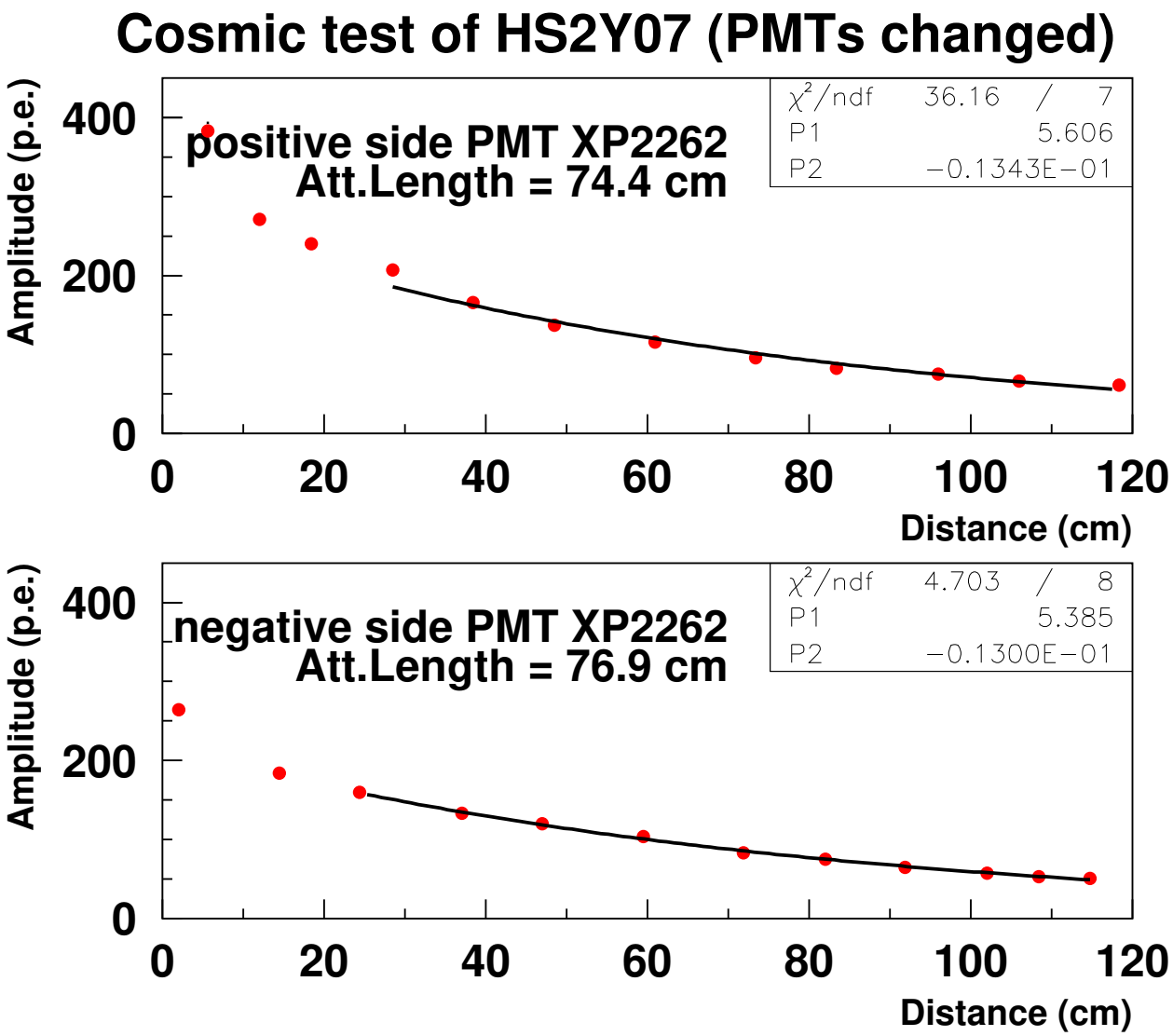

a8-55 {a8-55>5 &&a8-55<275}
htemp
Entries 18928
Mean 95.95
RMS 57.63
0 50 100 150 200 250 300
0 100 200 300 400 500


a8-55 {a8-55>5 &&a8-55<275}
htemp
Entries 4481
Mean 69.46
RMS 40.18
0 50 100 150 200 250 300
0 20 40 60 80 100 120 140 160 180 200 220


a8-55 {a8-55>5&&a8-55<275}
htemp
Entries 4527
Mean 69.99
RMS 39.14
0 50 100 150 200 250
0 20 40 60 80 100 120 140 160 180 200


Philips XP2262
GAIN
10 7
10 6
1.75
1.8
1.85
1.9
1.95
2
2.05
2.1
2.15
HV(kV)


XP2262 Linearity Check
HV=2.1 kV signal ~ I 0.86
HV=1.8 kV signal ~ I 0.97
SN 35325
PMT signal (p.e.)
2000
1000
0
0 5 10 15 20 25 30 35 40 45
Light Intensity,%
HV=2.1 kV signal ~ I 0.84
HV=1.9 kV signal ~ I 0.85
HV=1.8 kV signal ~ I 0.96
SN 35269
PMT signal (p.e.)
2000
1000
0
0 5 10 15 20 25 30 35 40 45
Light Intensity,%


Cosmic test of HS2Y07 (PMTs changed)
positive side PMT XP2262
Att.Length = 74.4 cm
χ²/ndf 36.16 / 7
P1 5.606
P2 −0.1343E−01
Amplitude (p.e.)
Distance (cm)
negative side PMT XP2262
Att.Length = 76.9 cm
χ²/ndf 4.703 / 8
P1 5.385
P2 −0.1300E−01
Amplitude (p.e.)
Distance (cm)

# Conclusions:

1. **Though the scintillator material is radioactively damaged, it is not the main cause of the deterioration of the timing properties of the counter;**

2. **The measurements points to the degradation of both cathode (low quantum efficiency) and dinode (low gain) surfaces of the PMTs, which are the thought reasons;**

3. **There is a limited capability of compensation through the adjustments of HVs on the PMT bases and lowering discriminator thresholds;**

4. **With change of PMTs it is possible to restore much of the timing properties of the counters, which can be done within this year;**

5. **Complete change of counters will require more time, manpower, expenses.**