Muon signal in Aug. 99 and new results for 98

Levitsky M.S.
09.12.99

Data

Aug.99

Muon 120 GeV runs 8492-8534

- X scan for Y=13.4cm 8492-8516
  X=(-24,24; step 2 cm)
  with MWPC data

- Y scan for X=8cm 8517-8534
  Y=(-16,16; step 2 cm)

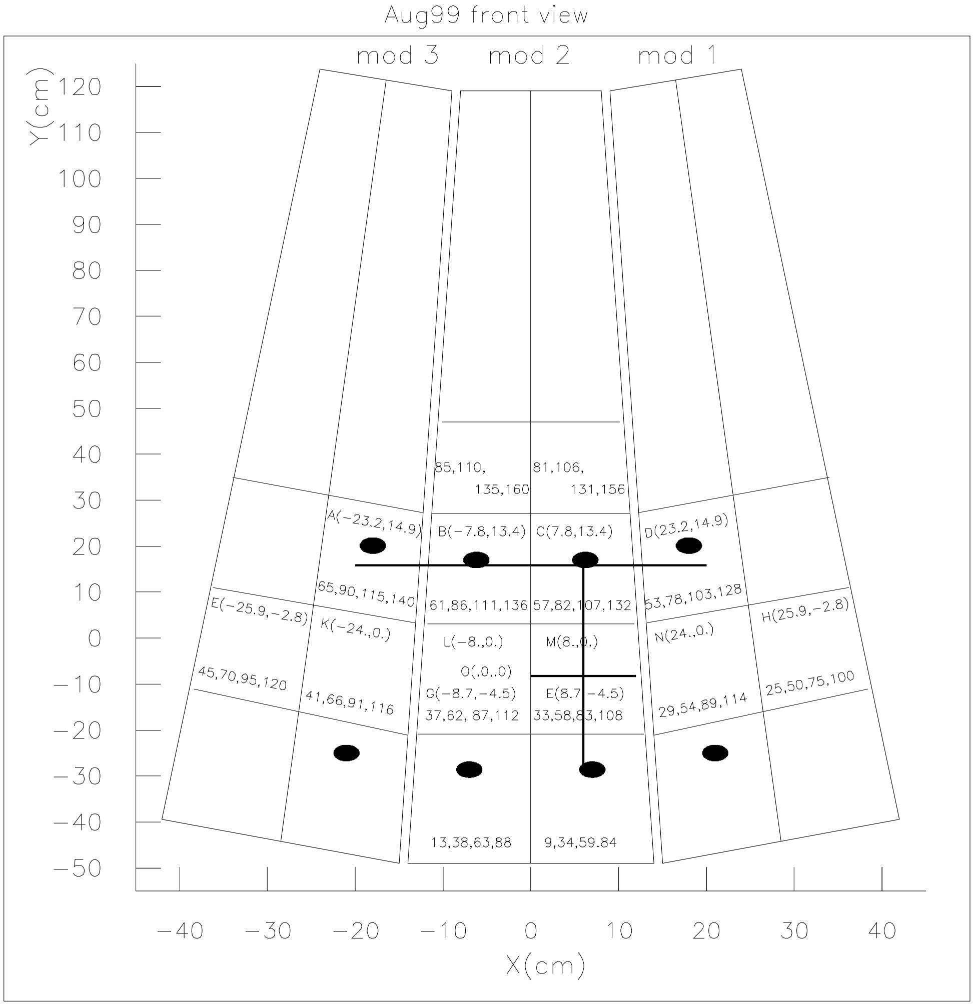
Muon 200 GeV 9336-9362

- 13 points 9336-9349

- X scan for Y=-4.5cm 9350-9362
  (unfinished)
  X=(0,12; step 1 cm)

Apr.98 Aug.98

Muon 120 GeV
12 and 9 runs



Aug99 front view
mod 3
mod 2
mod 1
Y(cm)
X(cm)
85,110,
135,160
81,106,
131,156
A(−23.2,14.9)
B(−7.8,13.4)
C(7.8,13.4)
D(23.2,14.9)
65,90,115,140
61,86,111,136
57,82,107,132
53,78,103,128
E(−25.9,−2.8)
K(−24.,0.)
L(−8.,0.)
M(8.,0.)
N(24.,0.)
H(25.9,−2.8)
O(.0,.0)
45,70,95,120
41,66,91,116
G(−8.7,−4.5)
E(8.7,−4.5)
37,62, 87,112
33,58,83,108
29,54,89,114
25,50,75,100
13,38,63,88
9,34,59.84

Calculation procedures

Aug99

- Pedestals - mean value of 3rd sample
- Only muon trigger for signal and noise
- Noise from first 5 time slices
- One method of signal reconstruction
  Cleland's method (optimal filter) for 5 samples
  files:
  dig weights amp aug99 991118.dat
  dig weights tim aug99 991118.dat
- Calibration file:
  coeff dig aug99 991118.dat
- Corrections (5 dead EST):
  W(k,n) where k module number and
  n segment number
  W(1,2)=1.33
  W(2,4)=1.33
  W(3,2)=2.0
  W(3,4)=1.33

- tdc raw offset:(muon 120/muon 200)
  segm.1 1350/897
  segm.2 1450/940
  segm.3 1200/723
  segm.4 1500/825
- tdc break point 2320/1420

Apr. and Aug. 98

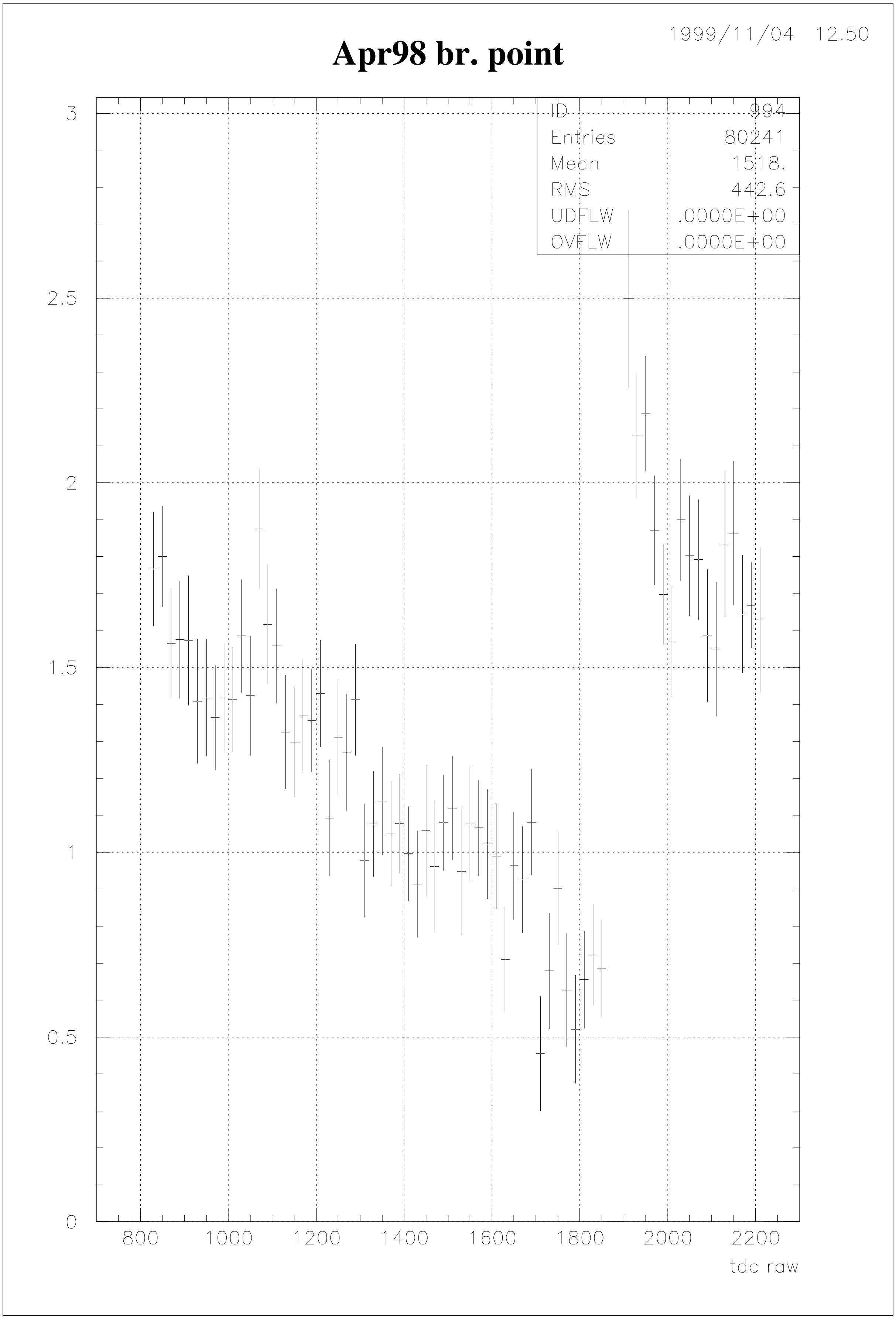
weights and calibration
coefficients - old

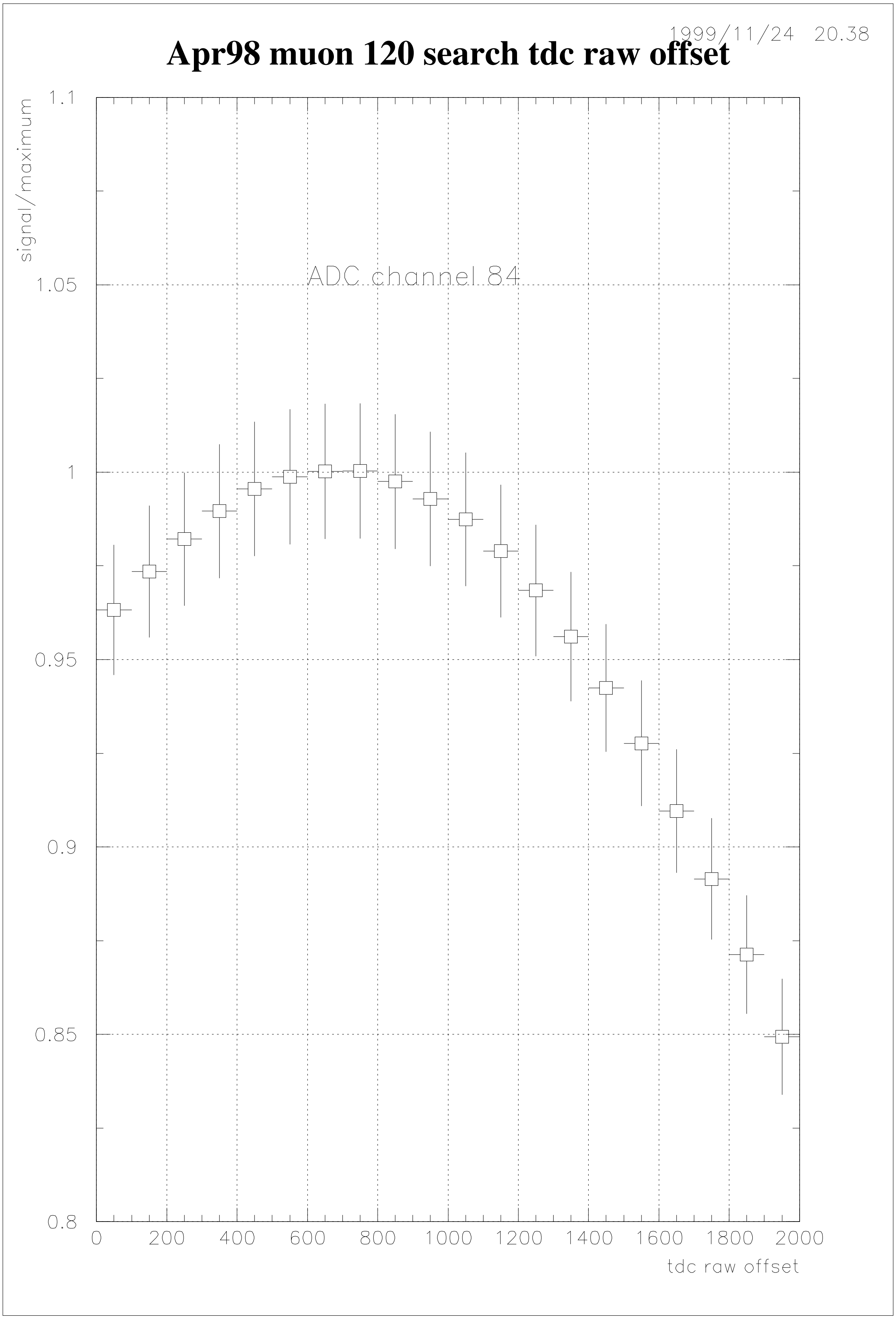
Apr.

- tdc raw offset:(Can./Eur.)
  segm.1 670/930
  segm.2 670/930
  segm.3 450/450
- tdc break point 1884

Aug.

- tdc raw offset:
  segm.1 350
  segm.2 300
  segm.3 -50
- tdc break point 2320


1999/11/04 12.50
Apr98 br. point
ID 994
Entries 80241
Mean 1518.
RMS 442.6
UDFLW .0000E+00
OVFLW .0000E+00
3
2.5
2
1.5
1
0.5
0
800
1000
1200
1400
1600
1800
2000
2200
tdc raw



1999/11/24 20.38
Apr98 muon 120 search tdc raw offset
signal/maximum
ADC channel 84
1.1
1.05
1
0.95
0.9
0.85
0.8
0
200
400
600
800
1000
1200
1400
1600
1800
2000
tdc raw offset

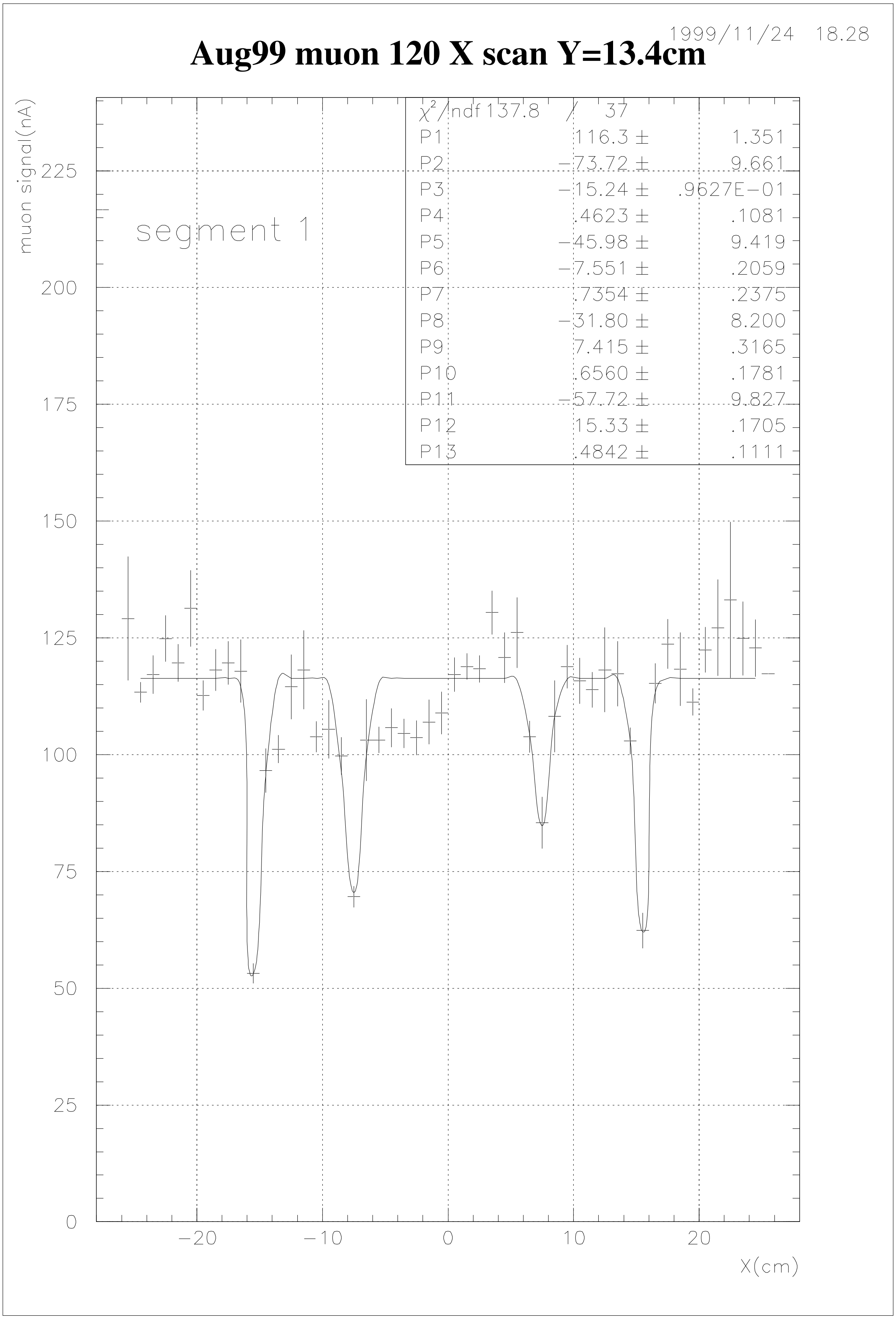
Results

- muon 120 GeV X scan demonstrates the position of tie rods and cracks between modules

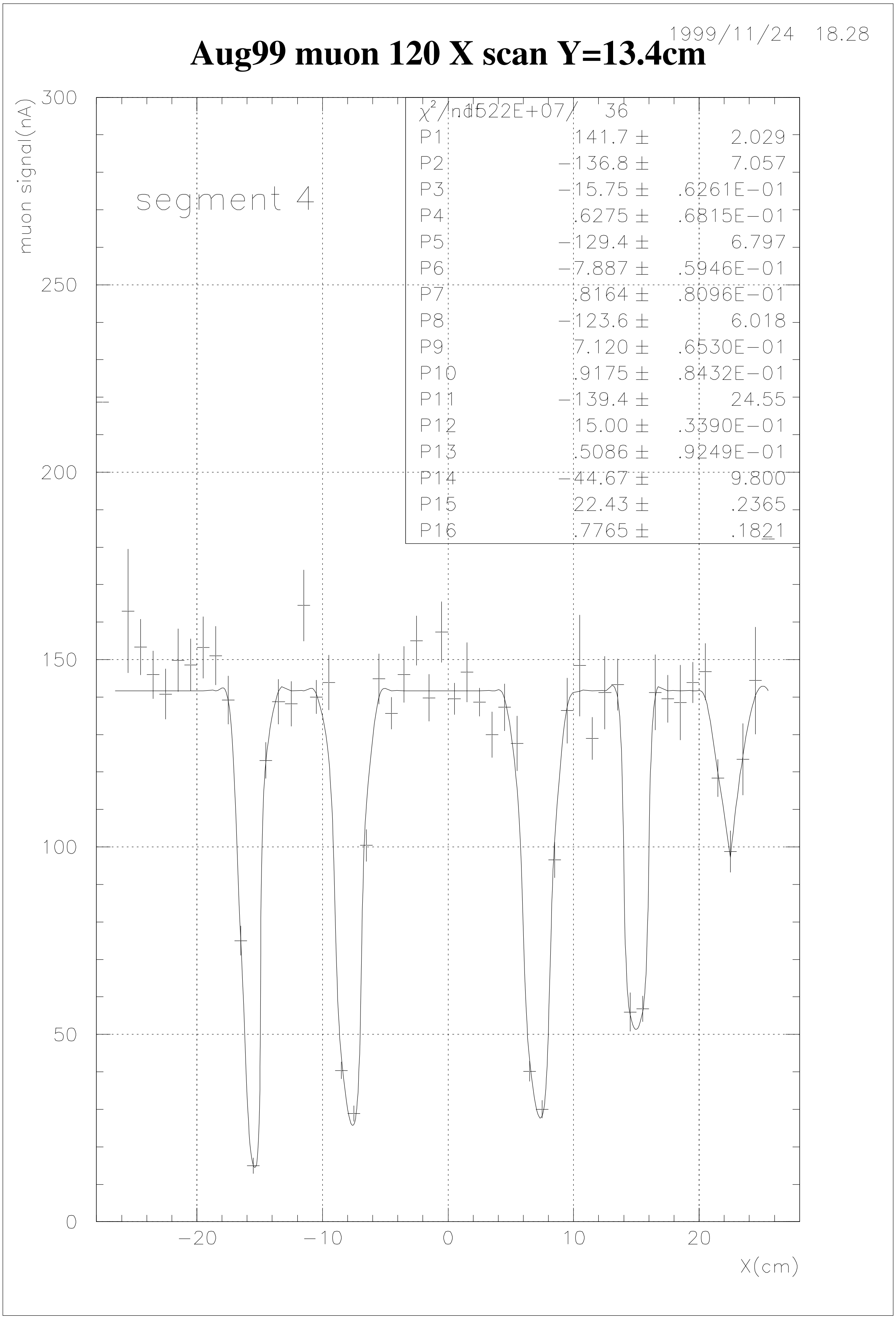
X positions of cracks and tie rods:
segm.1 -15.2 -7.6 7.4 15.3
segm.2 -15.5 -7.6 7.7 15.2
segm.3 -15.4 -7.5 7.4 15.2 22.4
segm.4 -15.8 -7.9 7.1 15.0 22.4

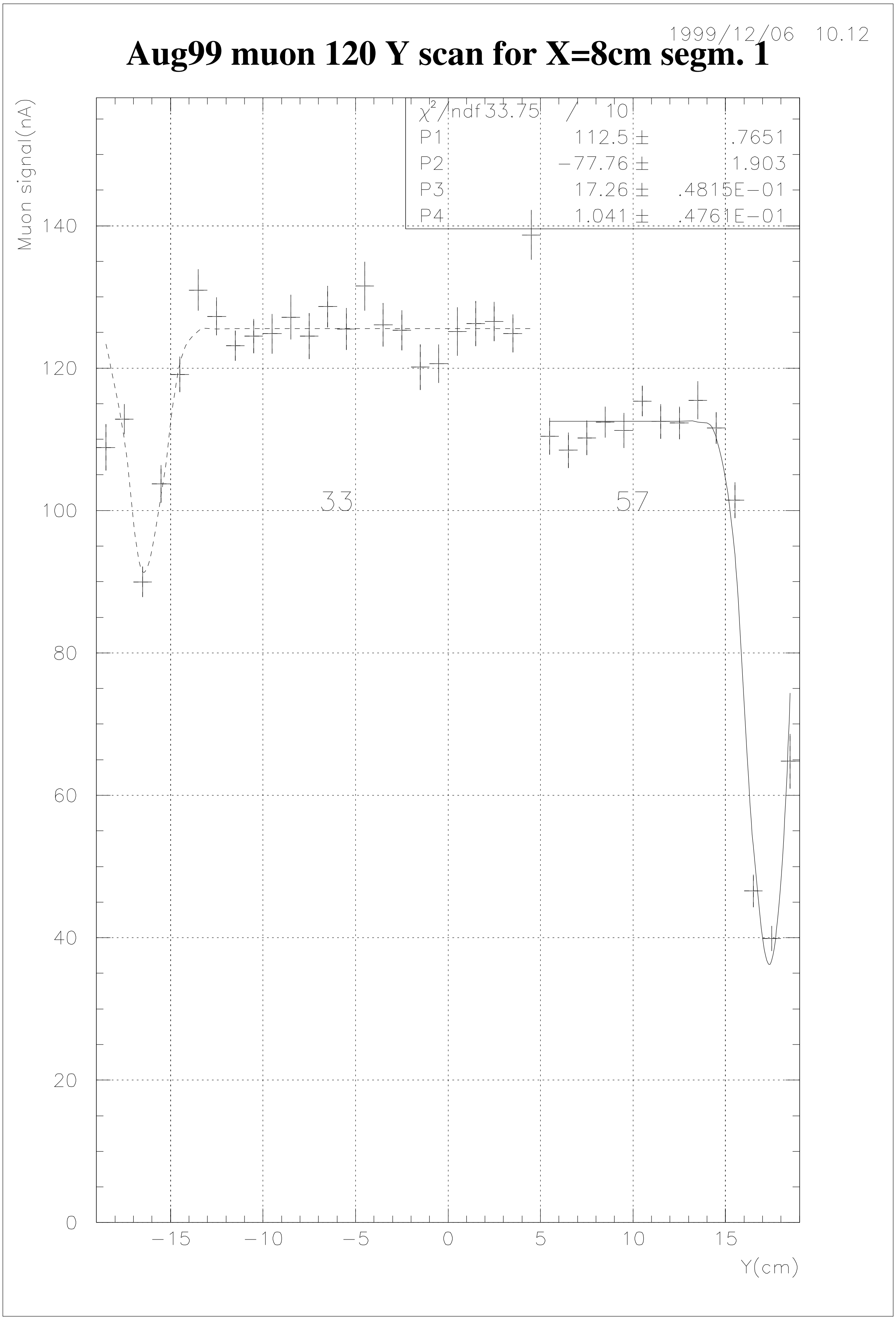
- muon 120 GeV Y scan

Y position of tie rods:
segm.1(Z= -84.5) -16.3 17.3
segm.2(Z=-125.4) -16.1 17.2
segm.3(Z=-183.9) -16.3 17.0
segm.4(Z=-231.9) -16.3 17.0

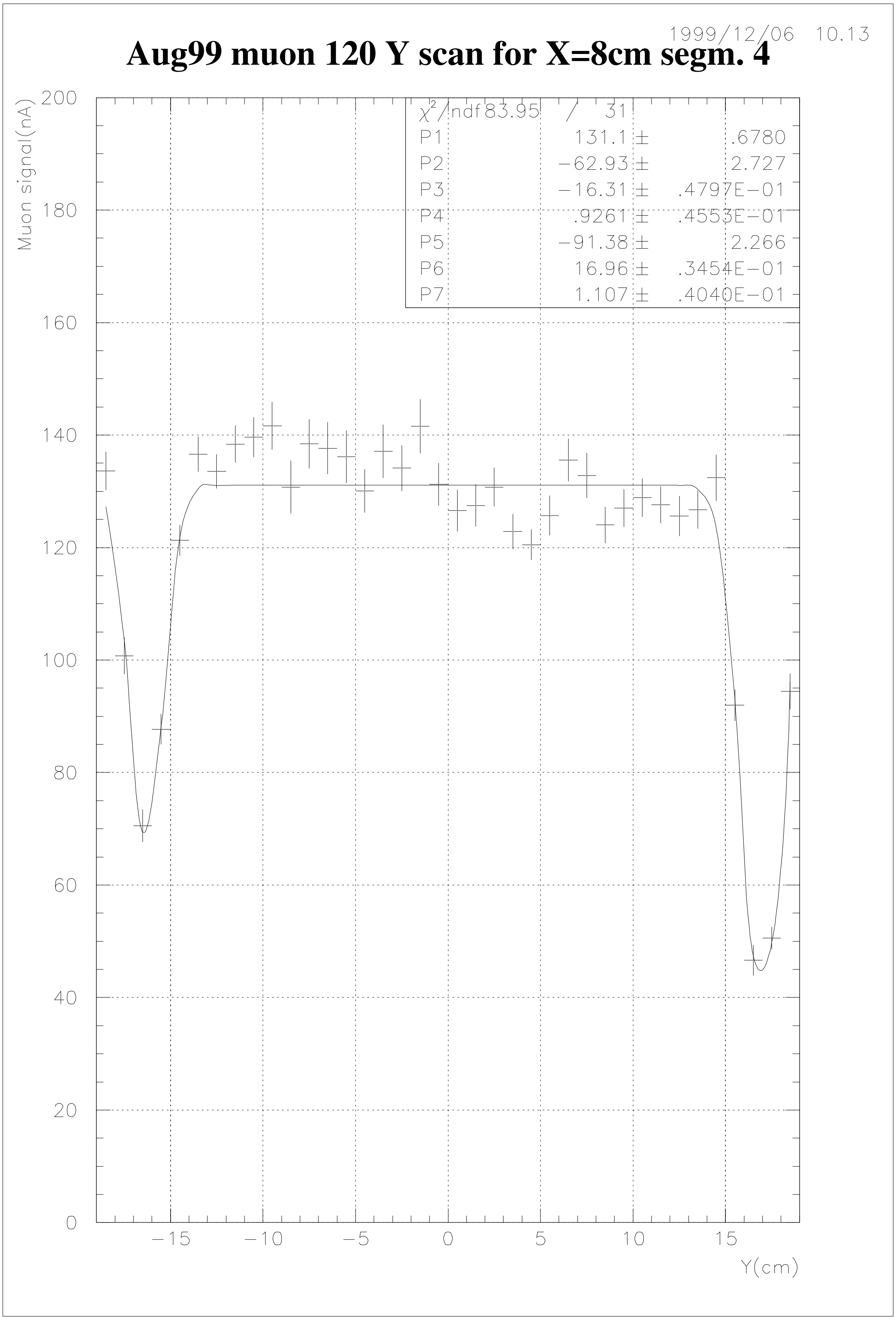


1999/11/24 18.28
Aug99 muon 120 X scan Y=13.4cm
χ²/ndf 137.8 / 37
P1 116.3 ± 1.351
P2 −73.72 ± 9.661
P3 −15.24 ± .9627E−01
P4 .4623 ± .1081
P5 −45.98 ± 9.419
P6 −7.551 ± .2059
P7 .7354 ± .2375
P8 −31.80 ± 8.200
P9 7.415 ± .3165
P10 .6560 ± .1781
P11 −57.72 ± 9.827
P12 15.33 ± .1705
P13 .4842 ± .1111
segment 1
muon signal(nA)
X(cm)
0
25
50
75
100
125
150
175
200
225
−20
−10
0
10
20


1999/11/24 18.28
Aug99 muon 120 X scan Y=13.4cm
χ²/ndf .1522E+07/ 36
P1 141.7 ± 2.029
P2 −136.8 ± 7.057
P3 −15.75 ± .6261E−01
P4 .6275 ± .6815E−01
P5 −129.4 ± 6.797
P6 −7.887 ± .5946E−01
P7 .8164 ± .8096E−01
P8 −123.6 ± 6.018
P9 7.120 ± .6530E−01
P10 .9175 ± .8432E−01
P11 −139.4 ± 24.55
P12 15.00 ± .3390E−01
P13 .5086 ± .9249E−01
P14 −44.67 ± 9.800
P15 22.43 ± .2365
P16 .7765 ± .1821
segment 4
muon signal(nA)
X(cm)



1999/12/06 10.12
Aug99 muon 120 Y scan for X=8cm segm. 1
χ²/ndf 33.75 / 10
P1 112.5 ± .7651
P2 −77.76 ± 1.903
P3 17.26 ± .4815E−01
P4 1.041 ± .4761E−01
Muon signal(nA)
Y(cm)
33
57
0
20
40
60
80
100
120
140
−15
−10
−5
0
5
10
15



1999/12/06 10.13
Aug99 muon 120 Y scan for X=8cm segm. 4
χ²/ndf 83.95 / 31
P1 131.1 ± .6780
P2 −62.93 ± 2.727
P3 −16.31 ± .4797E−01
P4 .9261 ± .4553E−01
P5 −91.38 ± 2.266
P6 16.96 ± .3454E−01
P7 1.107 ± .4040E−01
Muon signal(nA)
0
20
40
60
80
100
120
140
160
180
200
−15
−10
−5
0
5
10
15
Y(cm)

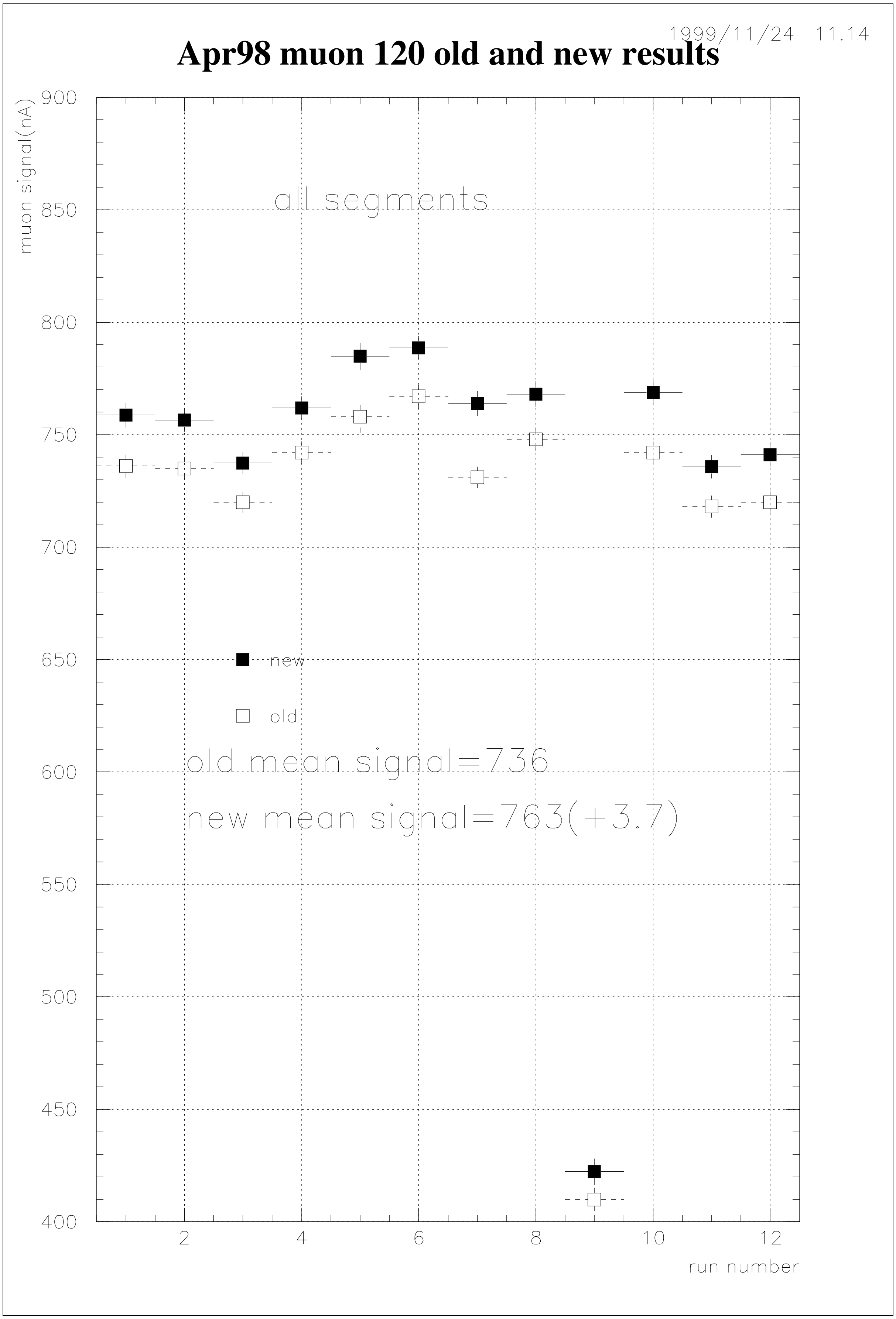
- muon 200 GeV 13 points
muon signal and noise(nA)

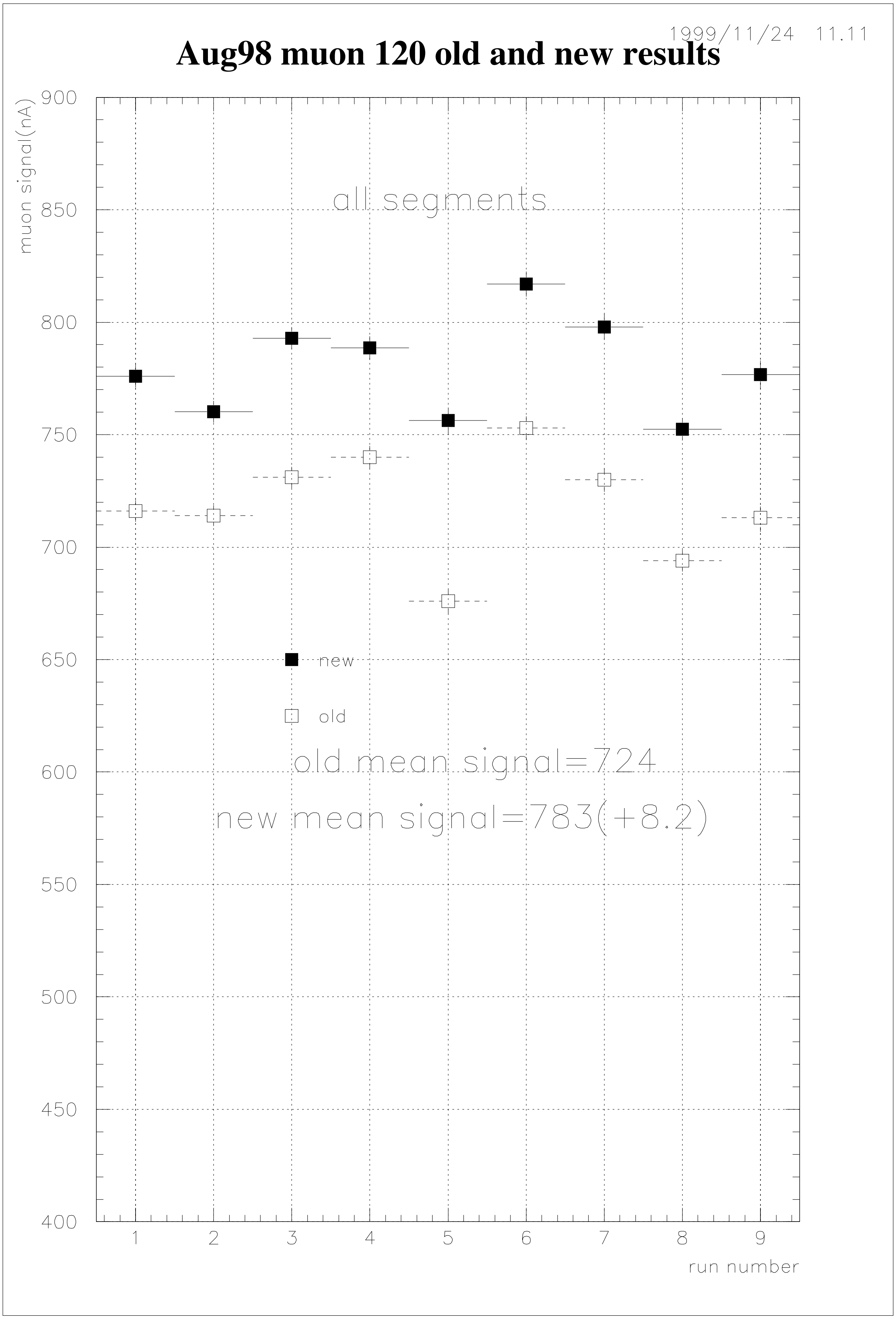
- A 670/176 B 632/213 C 696/269 D 676/160 - tie rods
- E 550/177 K 484/157 - without 91
- G 753/273 M 737/217 O 731/277 - bad ADC 33
- N 718/174 H 732/183 L 703/160 F 725/262 - good points

mean muon signal(N,H,L,F)=720 nA

mean muon signal at 120 GeV=639 nA

comparisons:
200 GeV/120 Gev=1.13
120 GeV Aug99/120 GeV Aug98(old/new)=.88/.82
............./120 GeV apr98(old/new)=.87/.84


1999/11/24 11.14
Apr98 muon 120 old and new results
muon signal(nA)
900
850
800
750
700
650
600
550
500
450
400
2
4
6
8
10
12
run number
all segments
new
old
old mean signal=736
new mean signal=763(+3.7)


1999/11/24 11.11
Aug98 muon 120 old and new results
muon signal(nA)
all segments
new
old
old mean signal=724
new mean signal=783(+8.2)
run number
900
850
800
750
700
650
600
550
500
450
400
1
2
3
4
5
6
7
8
9

Conclusions and plans

- the ratio muon signal at 200 GeV
to at 120 GeV is about 1.13

- the ratio muon signal at 120 GeV
obtained in this year to muon signal
obtained in 1998 is about .88(.83)
(second value was obtained with new method
of signal reconstruction)

- obtained new results for 1998 year runs
are increased about 4 and 8 percents
for April and August

- tie rods and module cracks clear
visible in muon X and Y scan

- it's need to prepare new weights
for 1998 year runs.