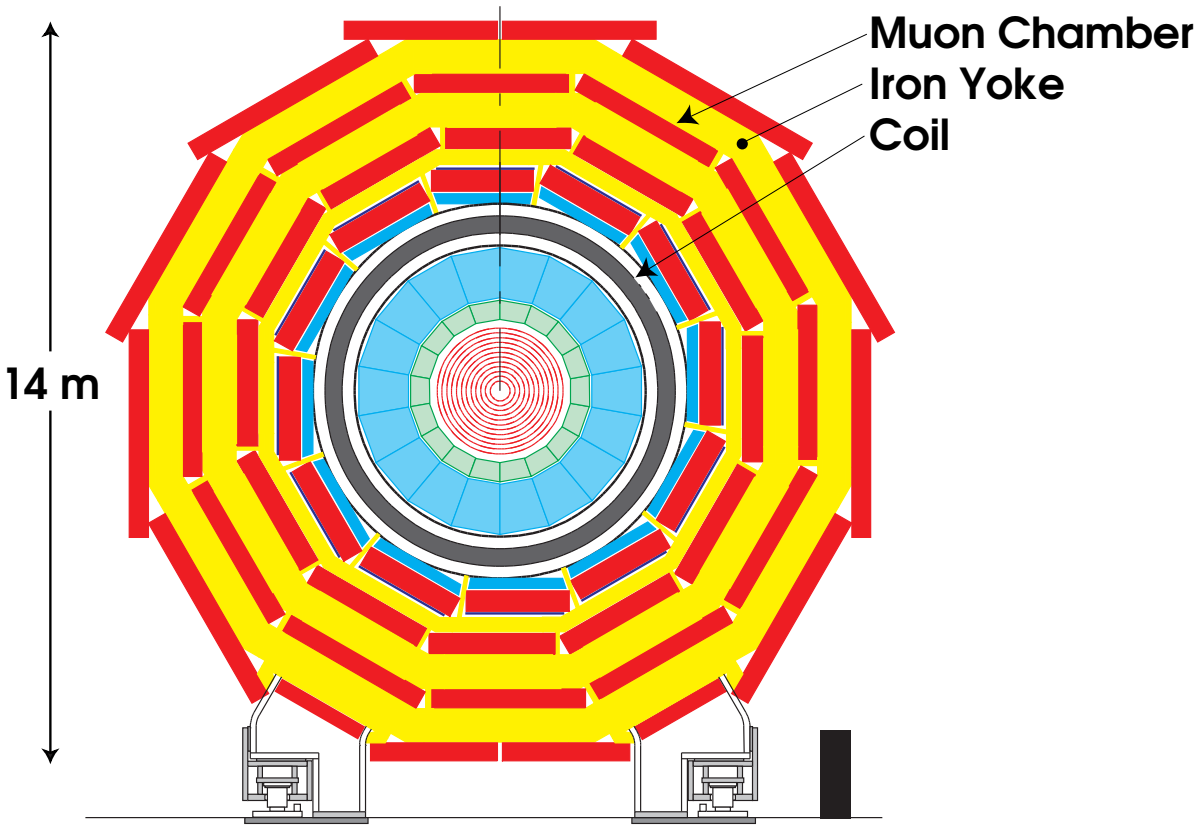


Figure no. 1

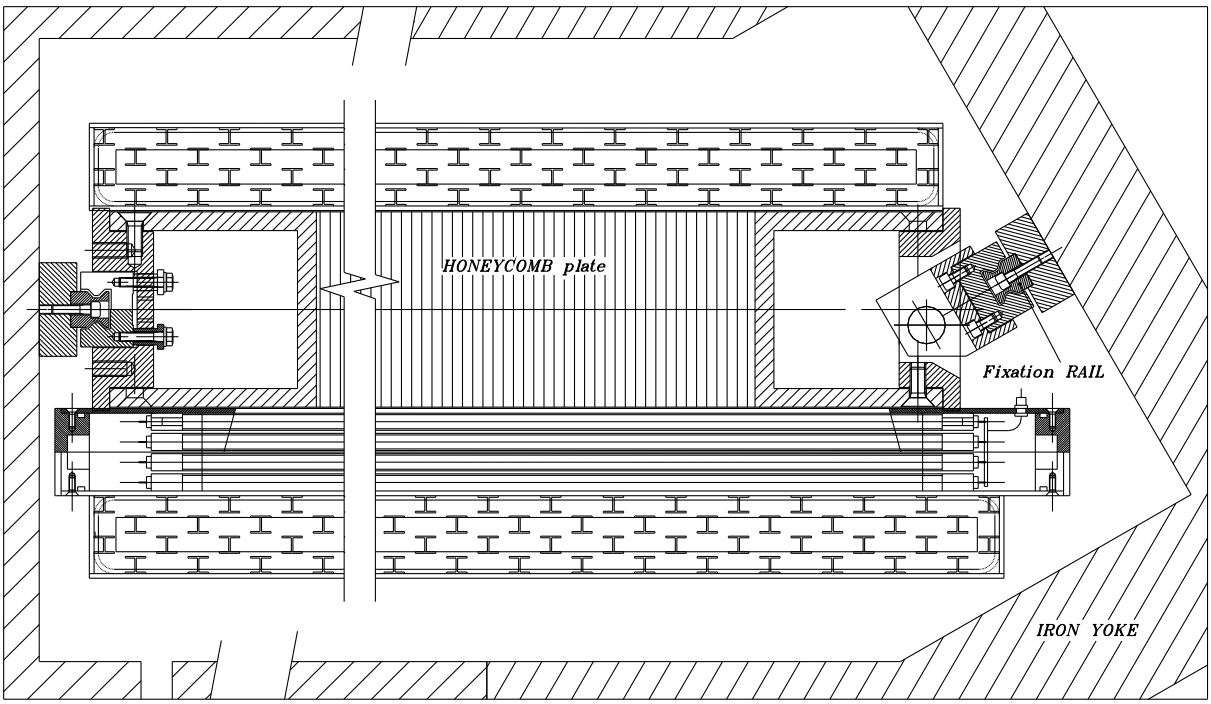


Figure no. 2

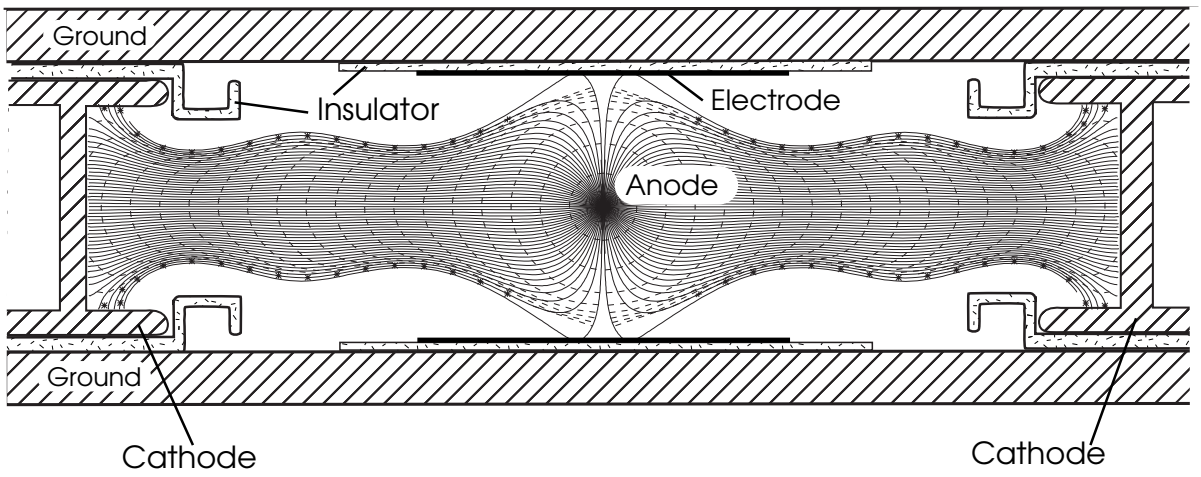
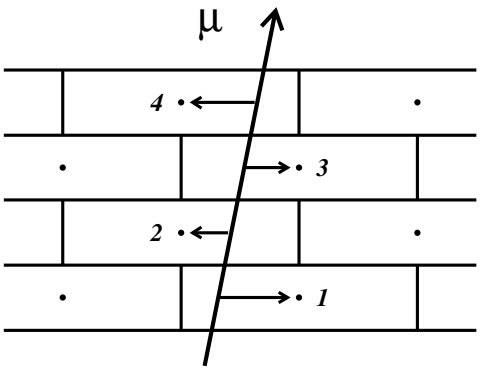
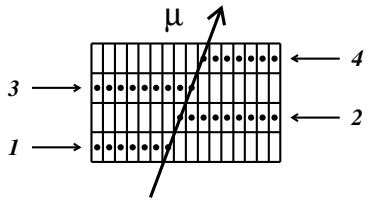


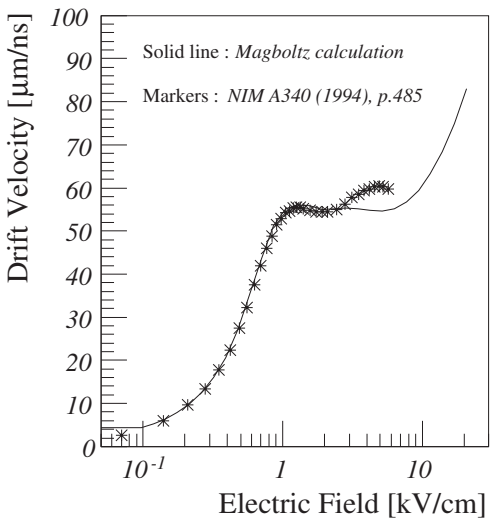
Figure no. 3





4 Shift Registers

Figure no. 4


Drift Velocity [μm/ns]
Solid line : Magboltz calculation
Markers : NIM A340 (1994), p.485
Electric Field [kV/cm]

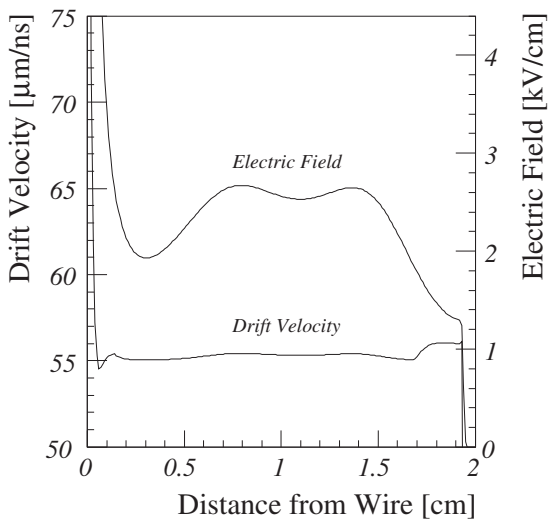

Drift Velocity [μm/ns]
Electric Field
Drift Velocity
Electric Field [kV/cm]
Distance from Wire [cm]

Figure no. 5

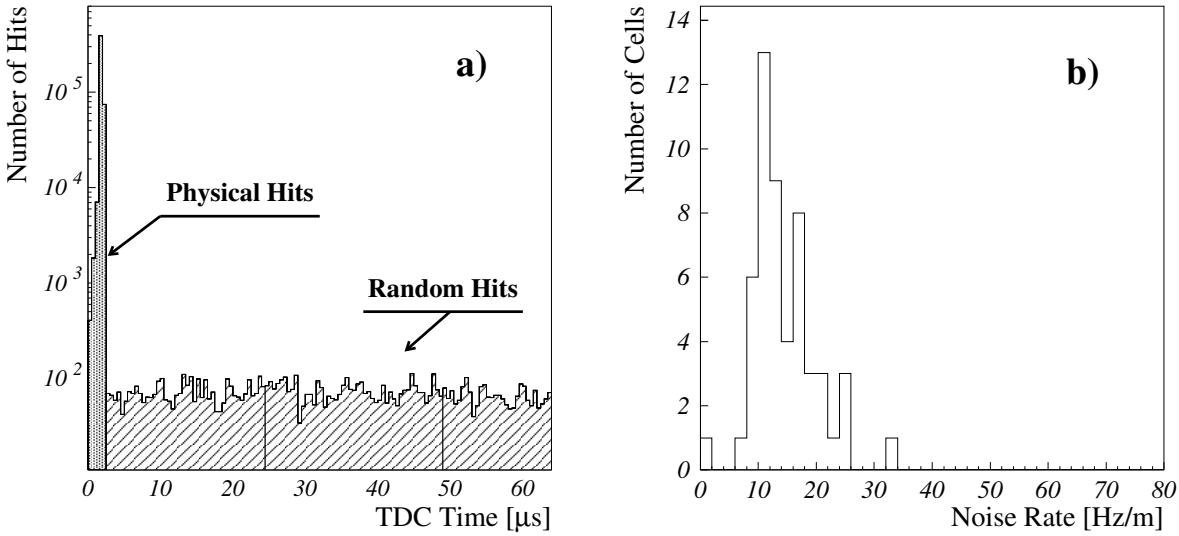

a)
Number of Hits
10^5
10^4
10^3
10^2
Physical Hits
Random Hits
0
10
20
30
40
50
60
TDC Time [μs]
b)
Number of Cells
14
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70
80
Noise Rate [Hz/m]

Figure no. 6

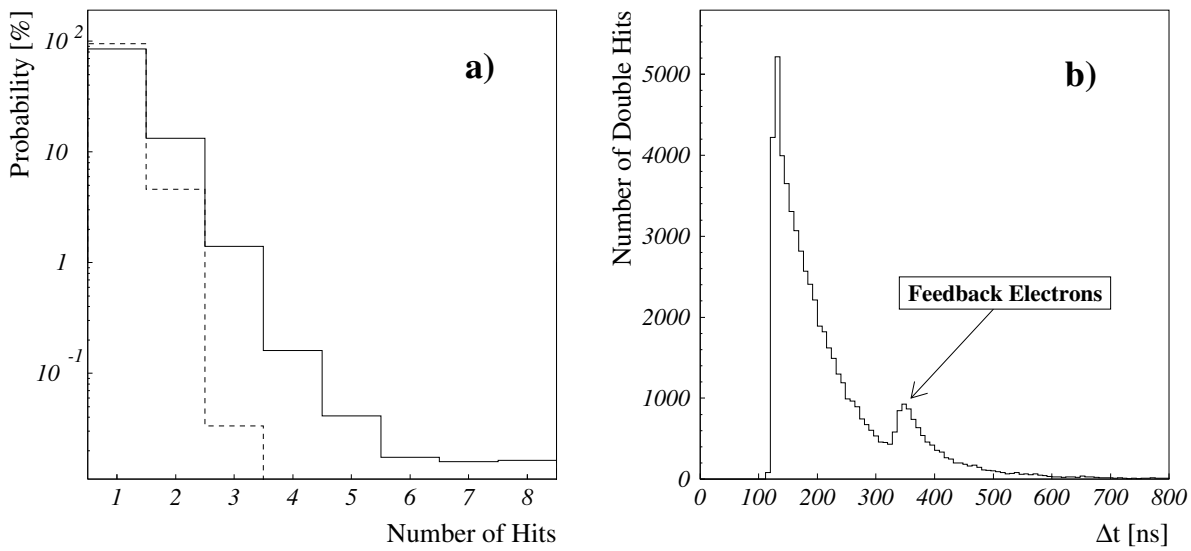

Probability [%]
10^2
10
1
10^{-1}
a)
1
2
3
4
5
6
7
8
Number of Hits
Number of Double Hits
5000
4000
3000
2000
1000
0
b)
Feedback Electrons
0
100
200
300
400
500
600
700
800
Δt [ns]

Figure no. 7

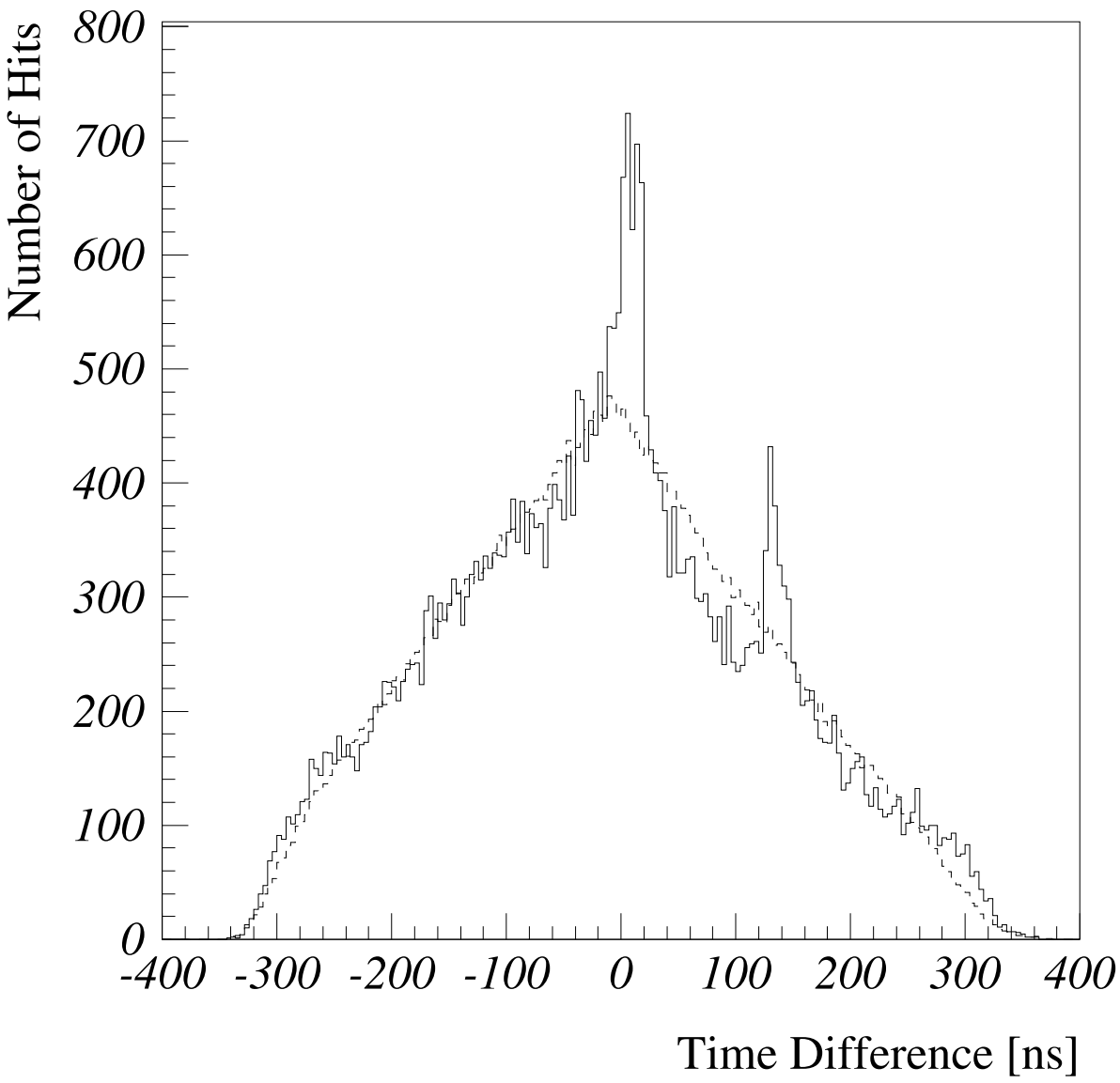

Number of Hits
800
700
600
500
400
300
200
100
0
-400
-300
-200
-100
0
100
200
300
400
Time Difference [ns]

Figure no. 8

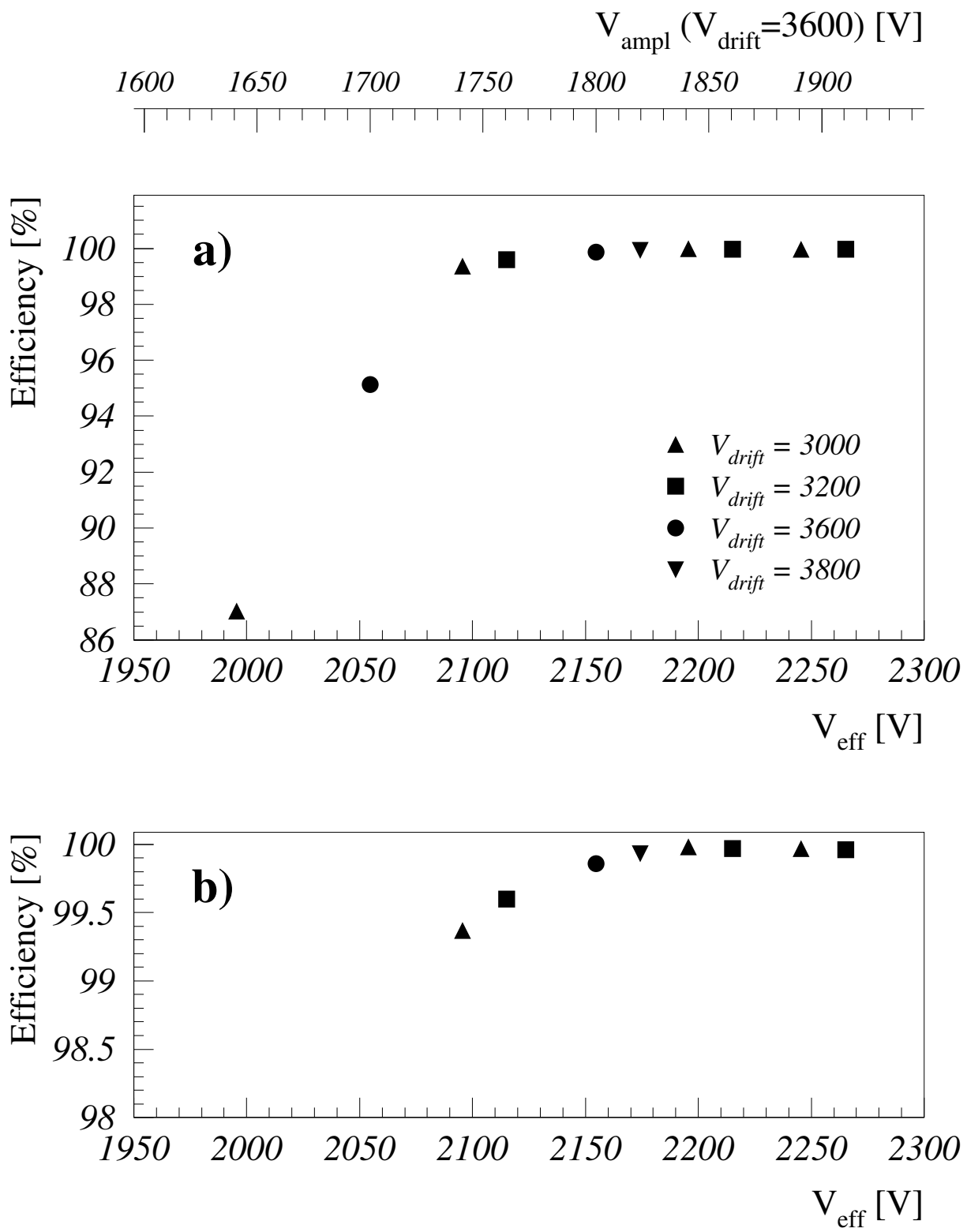

V_ampl (V_drift=3600) [V]
1600
1650
1700
1750
1800
1850
1900
Efficiency [%]
a)
100
98
96
94
92
90
88
86
V_drift = 3000
V_drift = 3200
V_drift = 3600
V_drift = 3800
1950
2000
2050
2100
2150
2200
2250
2300
V_eff [V]
Efficiency [%]
b)
100
99.5
99
98.5
98
1950
2000
2050
2100
2150
2200
2250
2300
V_eff [V]

Figure no. 9

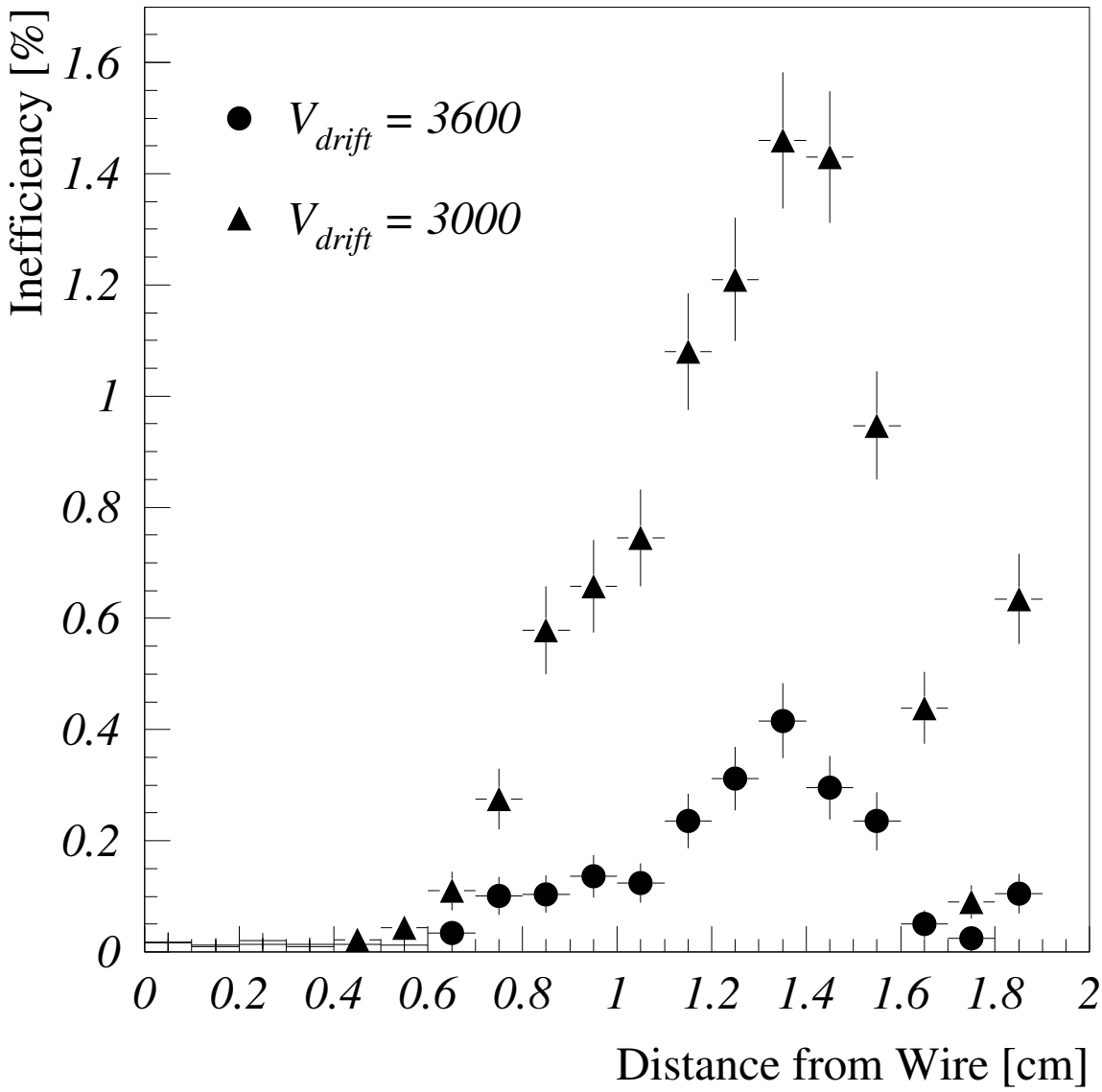

Inefficiency [%]
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
V_{drift} = 3600
V_{drift} = 3000
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
Distance from Wire [cm]

Figure no. 10

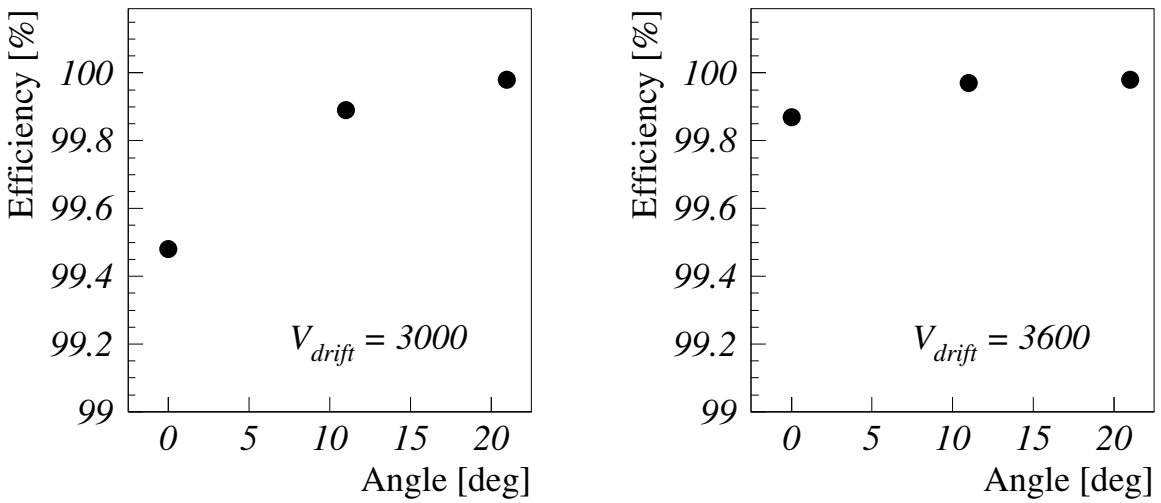

Efficiency [%]
100
99.8
99.6
99.4
99.2
99
V_{drift} = 3000
0
5
10
15
20
Angle [deg]
Efficiency [%]
100
99.8
99.6
99.4
99.2
99
V_{drift} = 3600
0
5
10
15
20
Angle [deg]

Figure no. 11

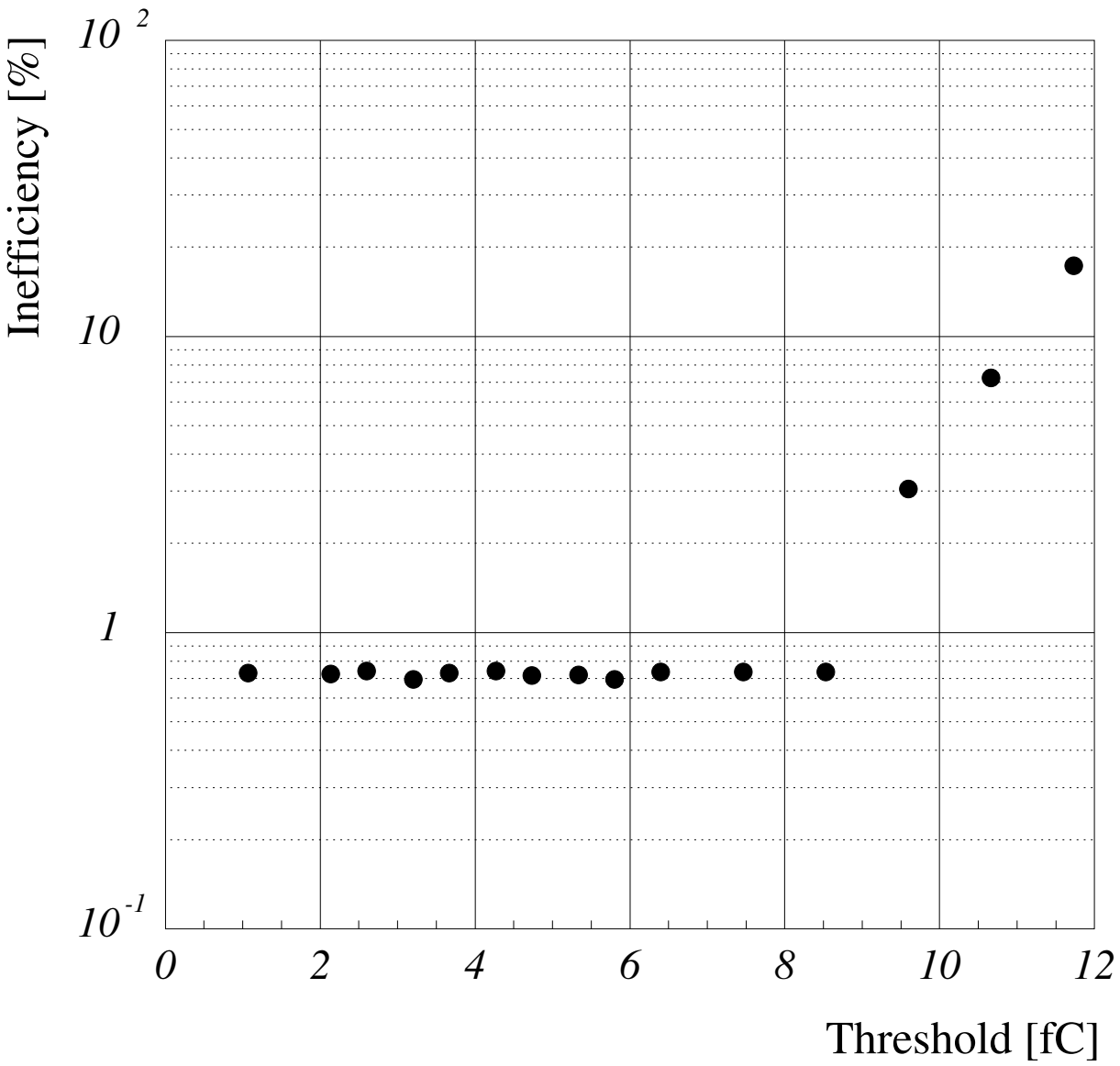


Figure no. 12

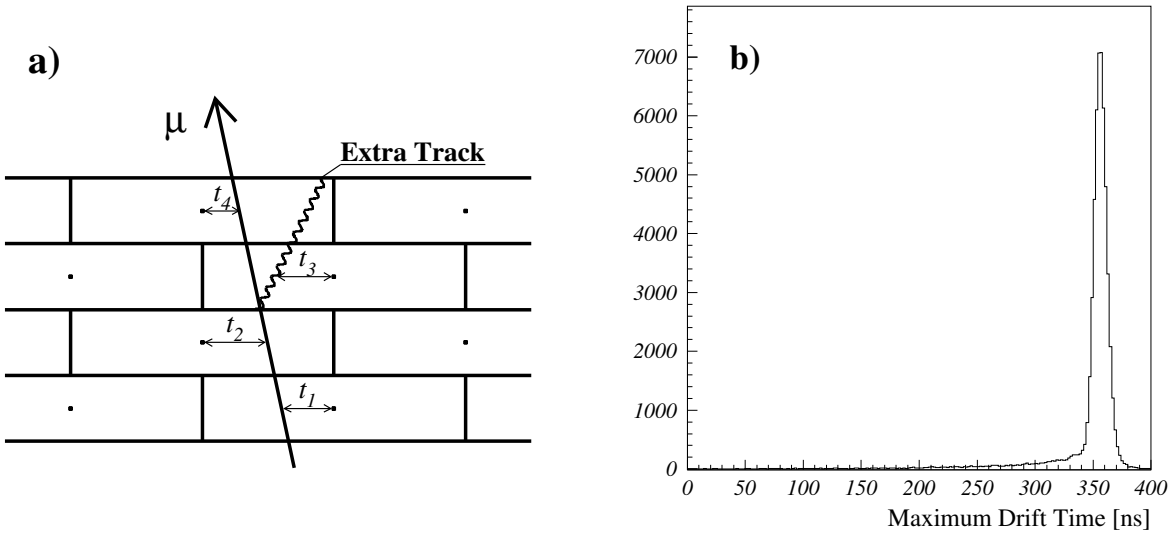

a)
μ
Extra Track
t_4
t_3
t_2
t_1
b)
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250
300
350
400
Maximum Drift Time [ns]

Figure no. 13

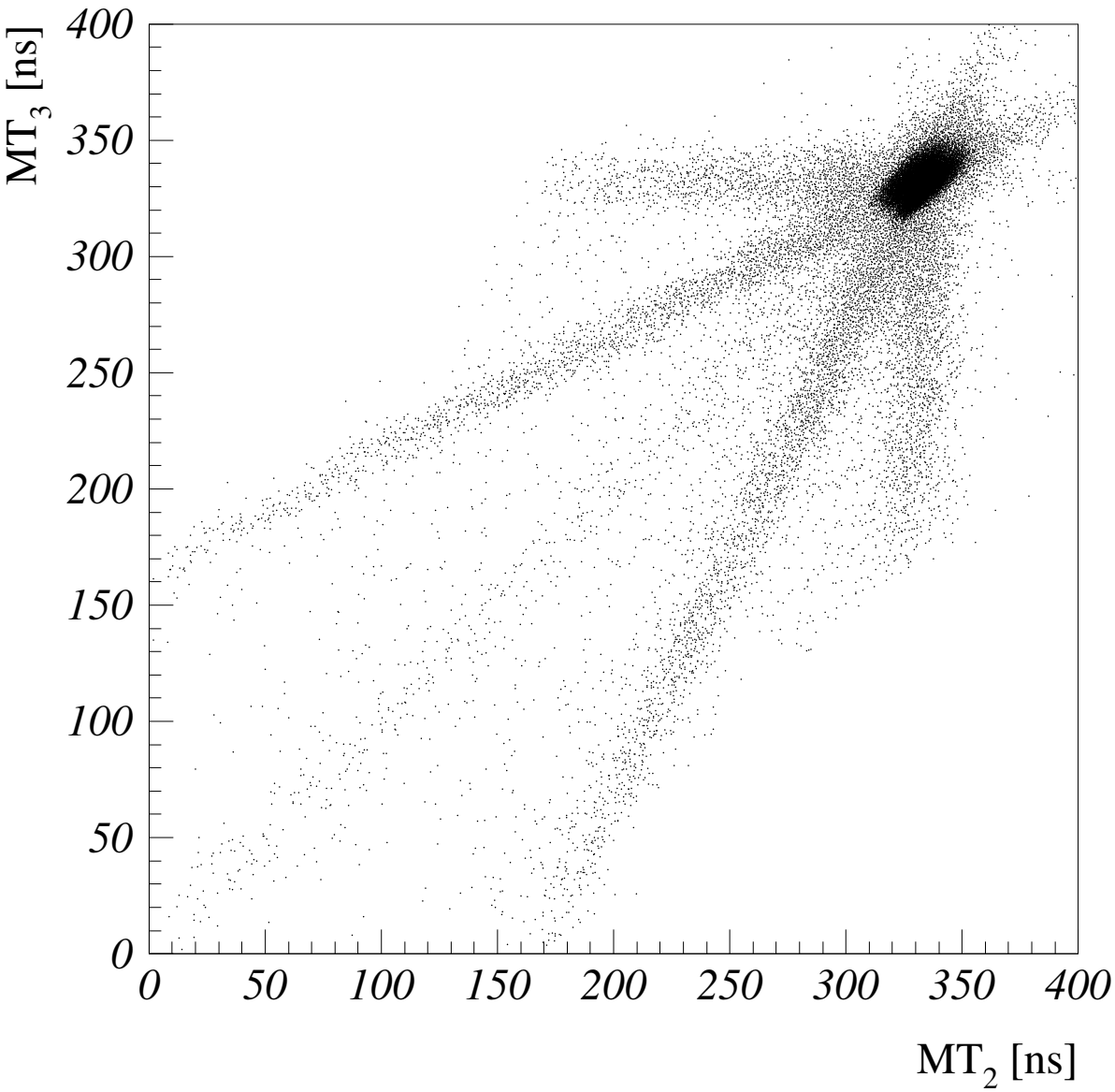

MT3 [ns]
400
350
300
250
200
150
100
50
0
0
50
100
150
200
250
300
350
400
MT2 [ns]

Figure no. 14

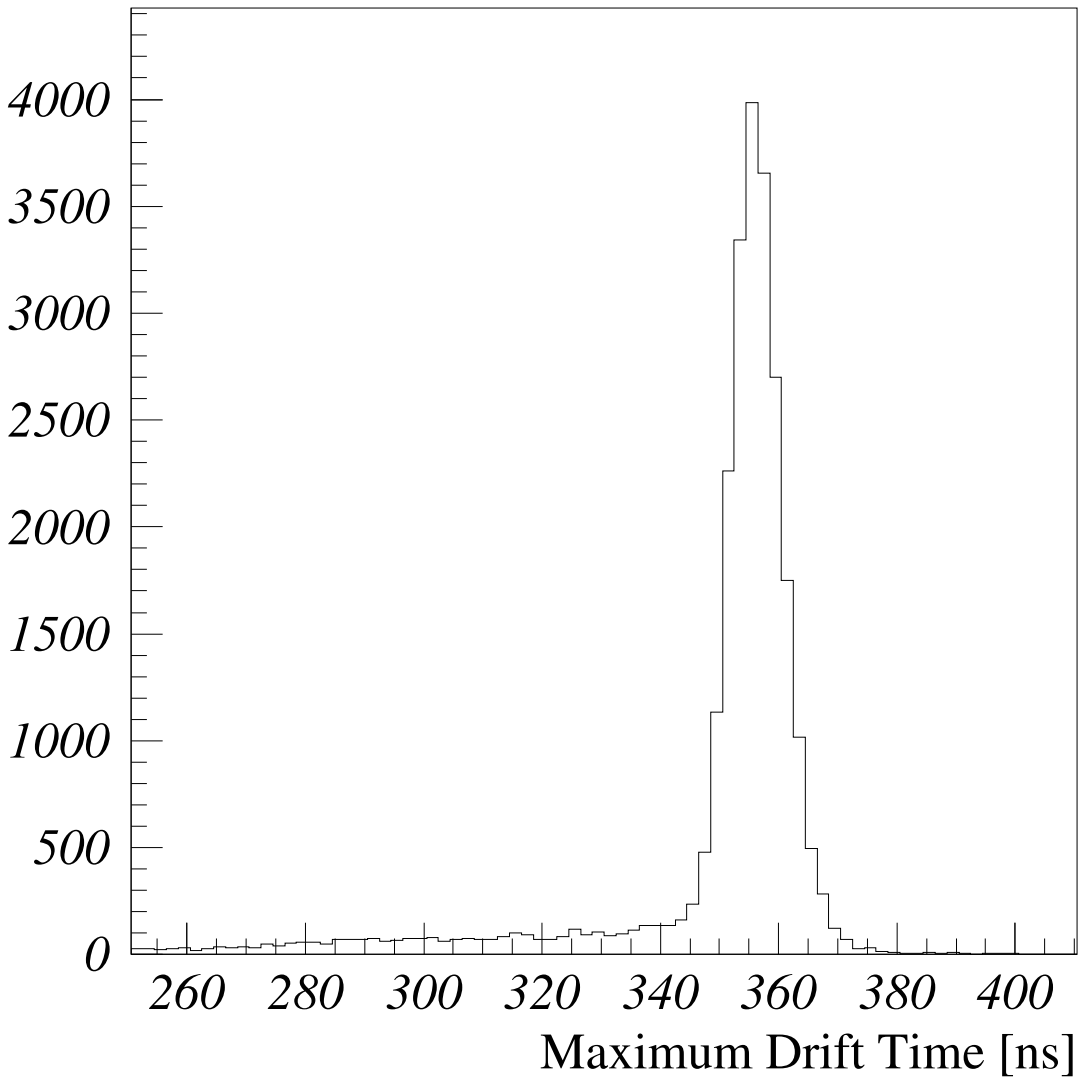

4000
3500
3000
2500
2000
1500
1000
500
0
260
280
300
320
340
360
380
400
Maximum Drift Time [ns]

Figure no. 15

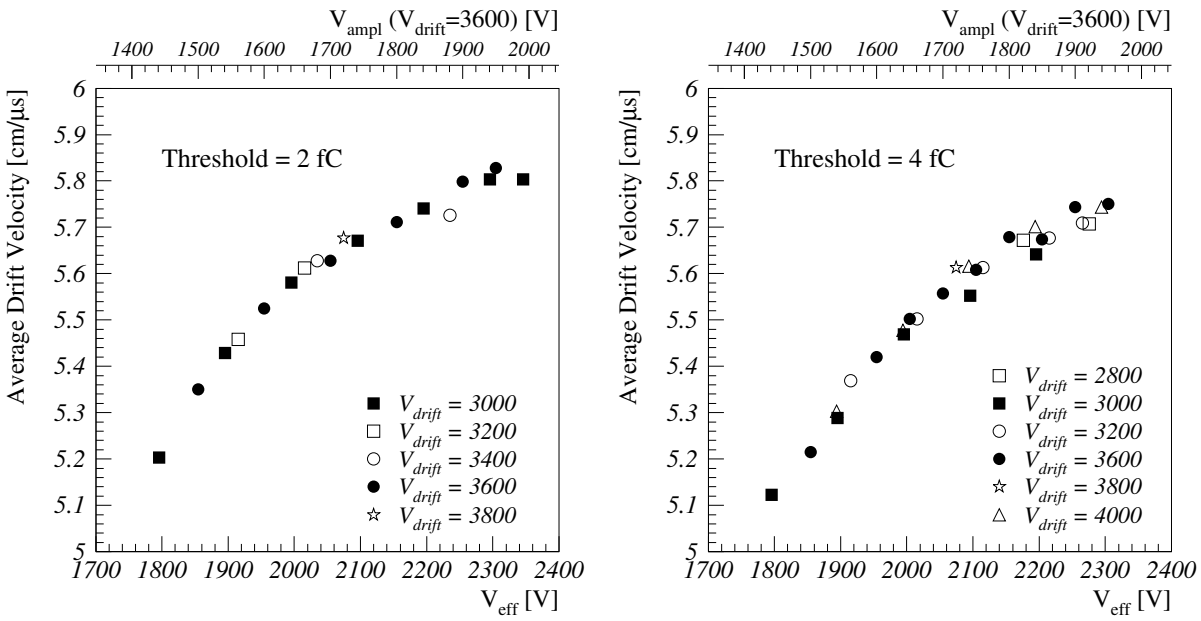

V_ampl (V_drift=3600) [V]
1400 1500 1600 1700 1800 1900 2000
Average Drift Velocity [cm/µs]
6 5.9 5.8 5.7 5.6 5.5 5.4 5.3 5.2 5.1 5
Threshold = 2 fC
V_drift = 3000
V_drift = 3200
V_drift = 3400
V_drift = 3600
V_drift = 3800
1700 1800 1900 2000 2100 2200 2300 2400
V_eff [V]
V_ampl (V_drift=3600) [V]
1400 1500 1600 1700 1800 1900 2000
Average Drift Velocity [cm/µs]
6 5.9 5.8 5.7 5.6 5.5 5.4 5.3 5.2 5.1 5
Threshold = 4 fC
V_drift = 2800
V_drift = 3000
V_drift = 3200
V_drift = 3600
V_drift = 3800
V_drift = 4000
1700 1800 1900 2000 2100 2200 2300 2400
V_eff [V]

Figure no. 16

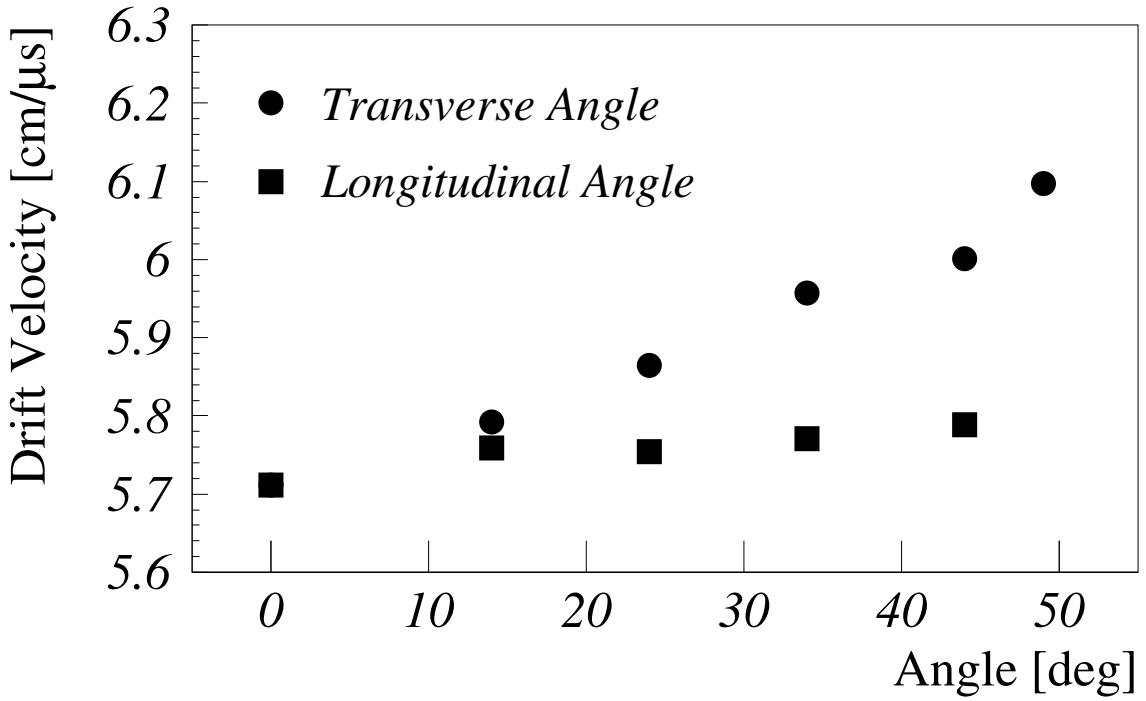

Drift Velocity [cm/μs]
6.3
6.2
6.1
6
5.9
5.8
5.7
5.6
Transverse Angle
Longitudinal Angle
0
10
20
30
40
50
Angle [deg]

Figure no. 17

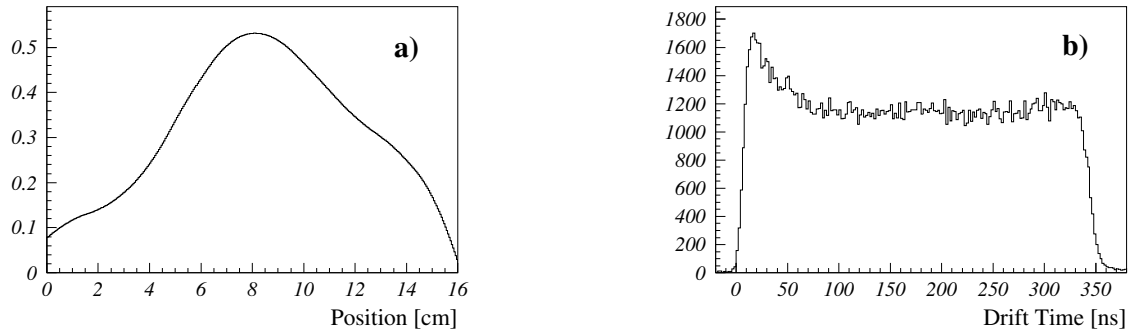

a)
0.5
0.4
0.3
0.2
0.1
0
0 2 4 6 8 10 12 14 16
Position [cm]
b)
1800
1600
1400
1200
1000
800
600
400
200
0
0 50 100 150 200 250 300 350
Drift Time [ns]

Figure no. 18

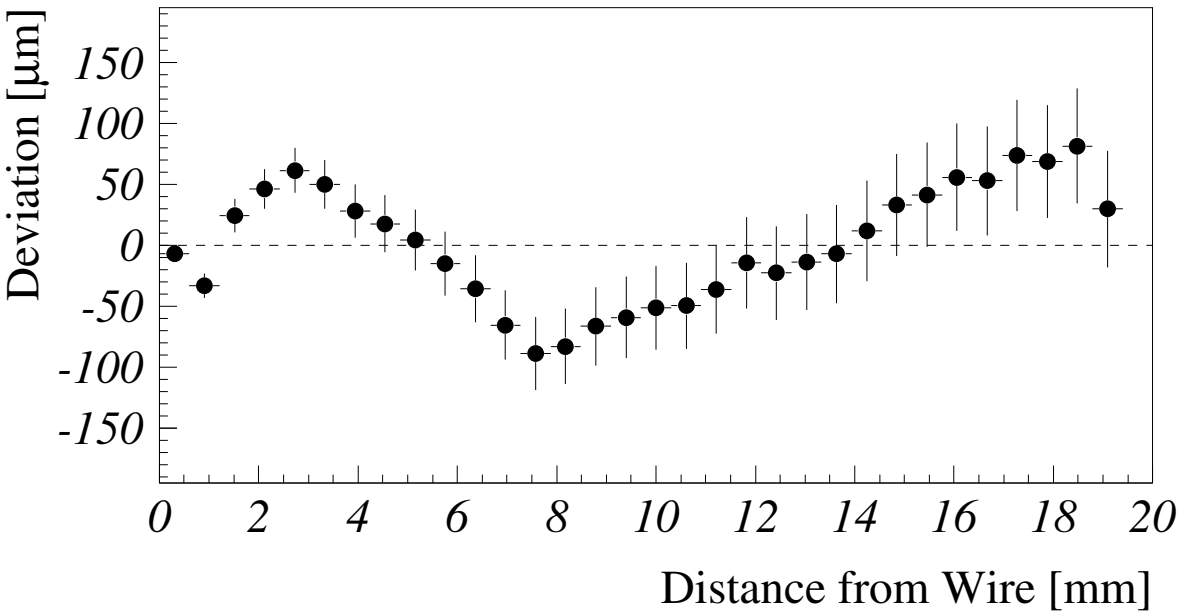

Deviation [μm]
150
100
50
0
-50
-100
-150
0
2
4
6
8
10
12
14
16
18
20
Distance from Wire [mm]

Figure no. 19

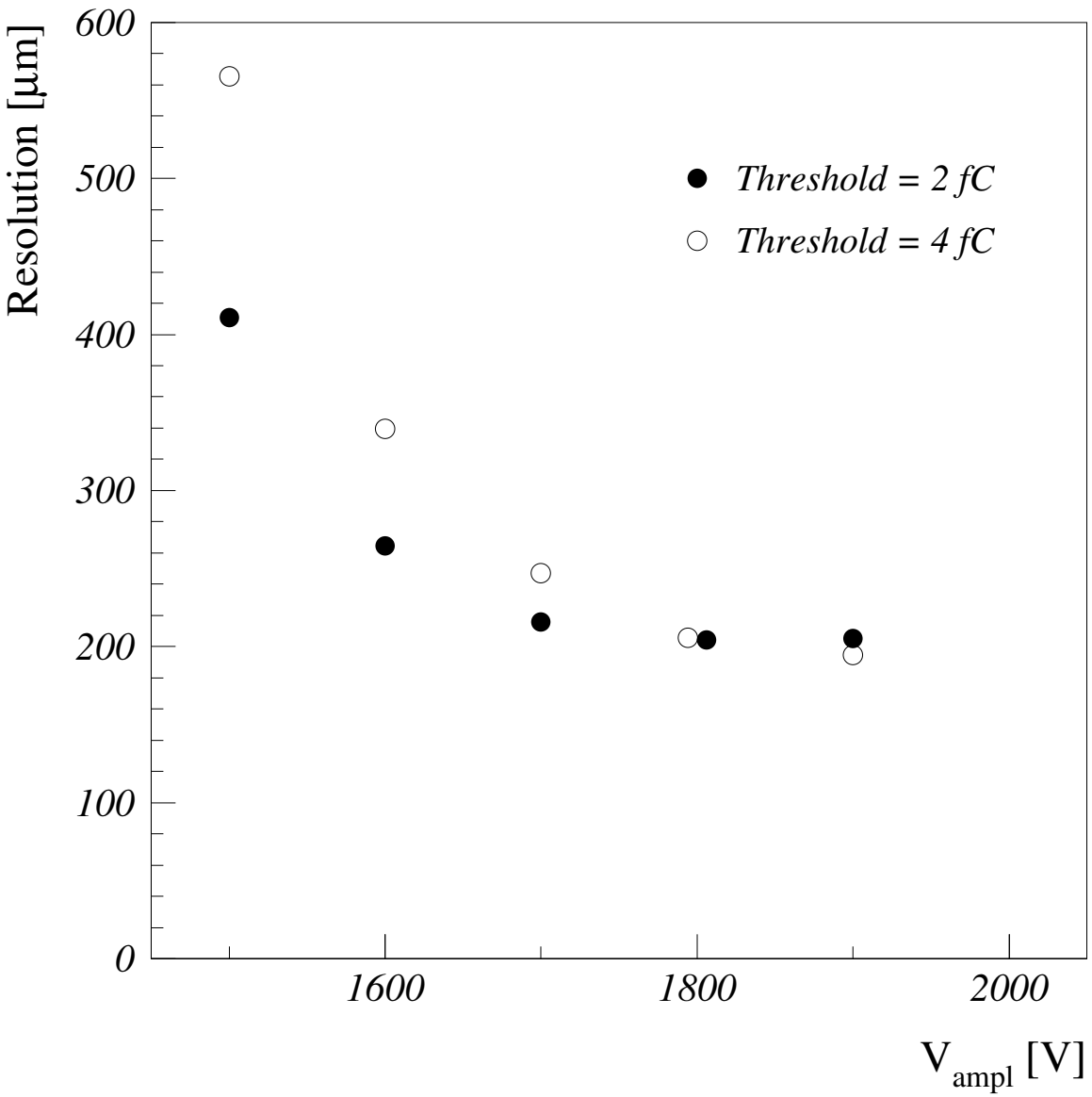

Resolution [μm]
600
500
400
300
200
100
0
1600
1800
2000
V ampl [V]
Threshold = 2 fC
Threshold = 4 fC

Figure no. 20

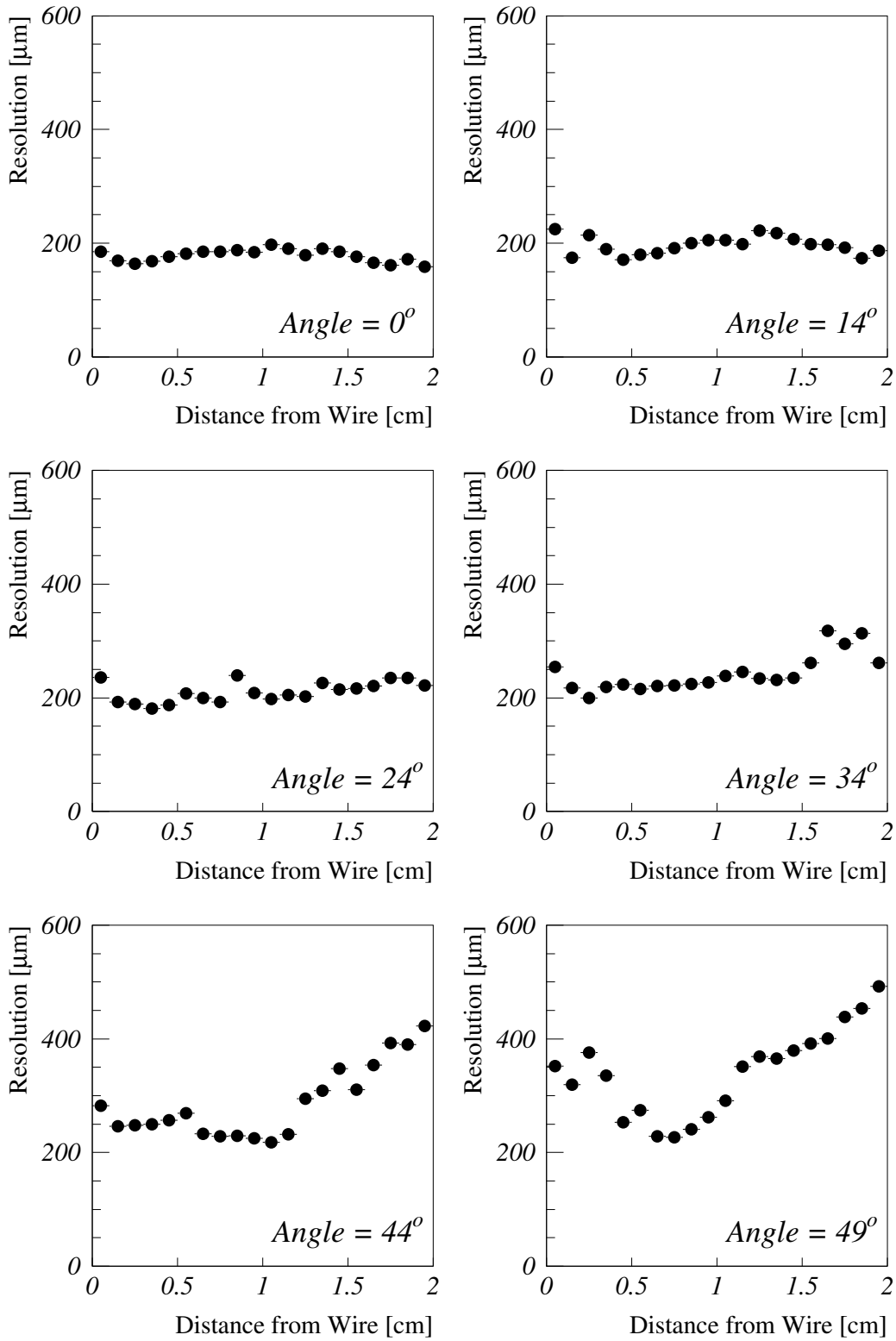

Resolution [µm]
600
400
200
0
0
0.5
1
1.5
2
Distance from Wire [cm]
Angle = 0°
Angle = 14°
Angle = 24°
Angle = 34°
Angle = 44°
Angle = 49°

Figure no. 21

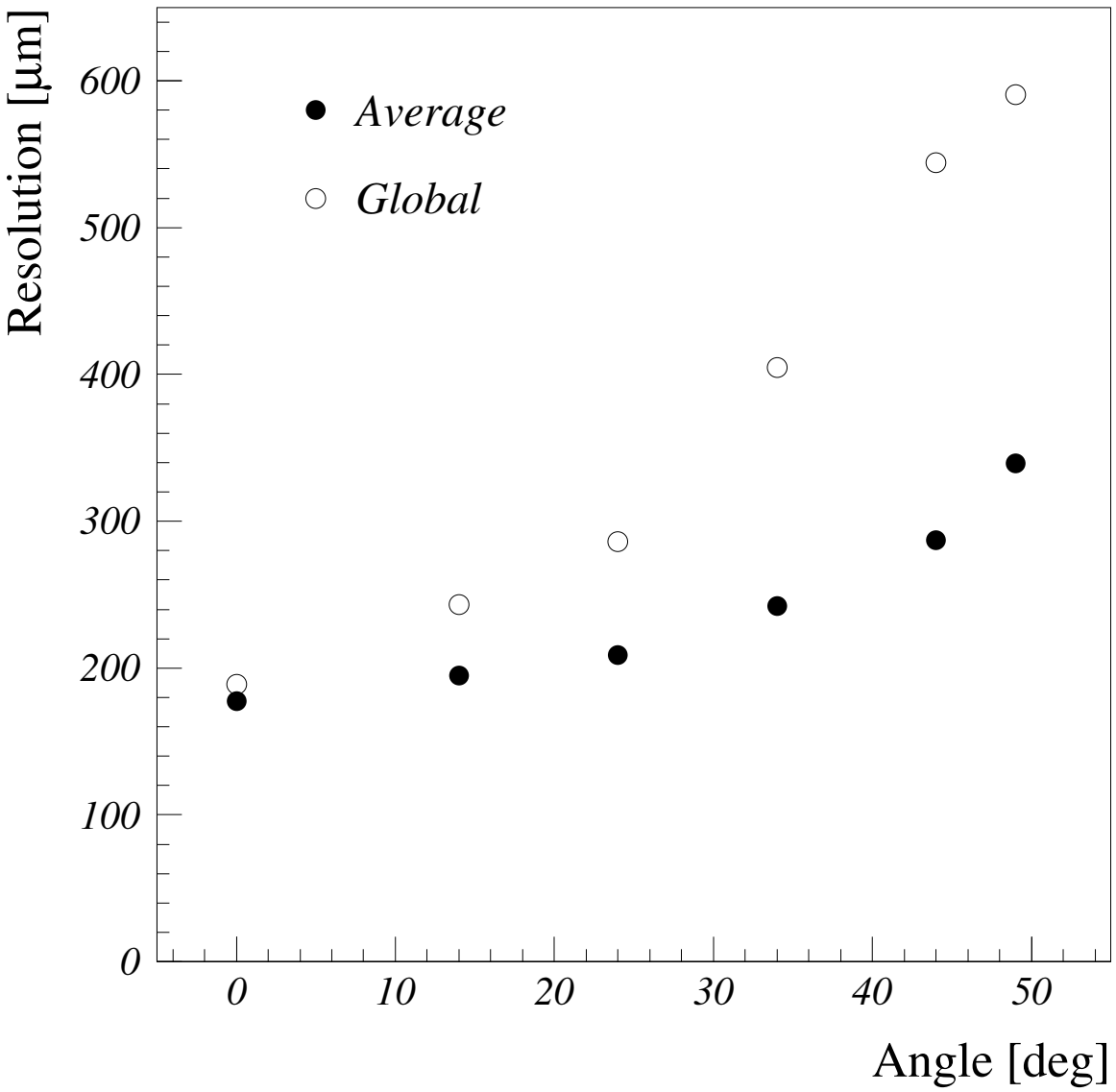

Resolution [μm]
600
500
400
300
200
100
0
Average
Global
0
10
20
30
40
50
Angle [deg]

Figure no. 22

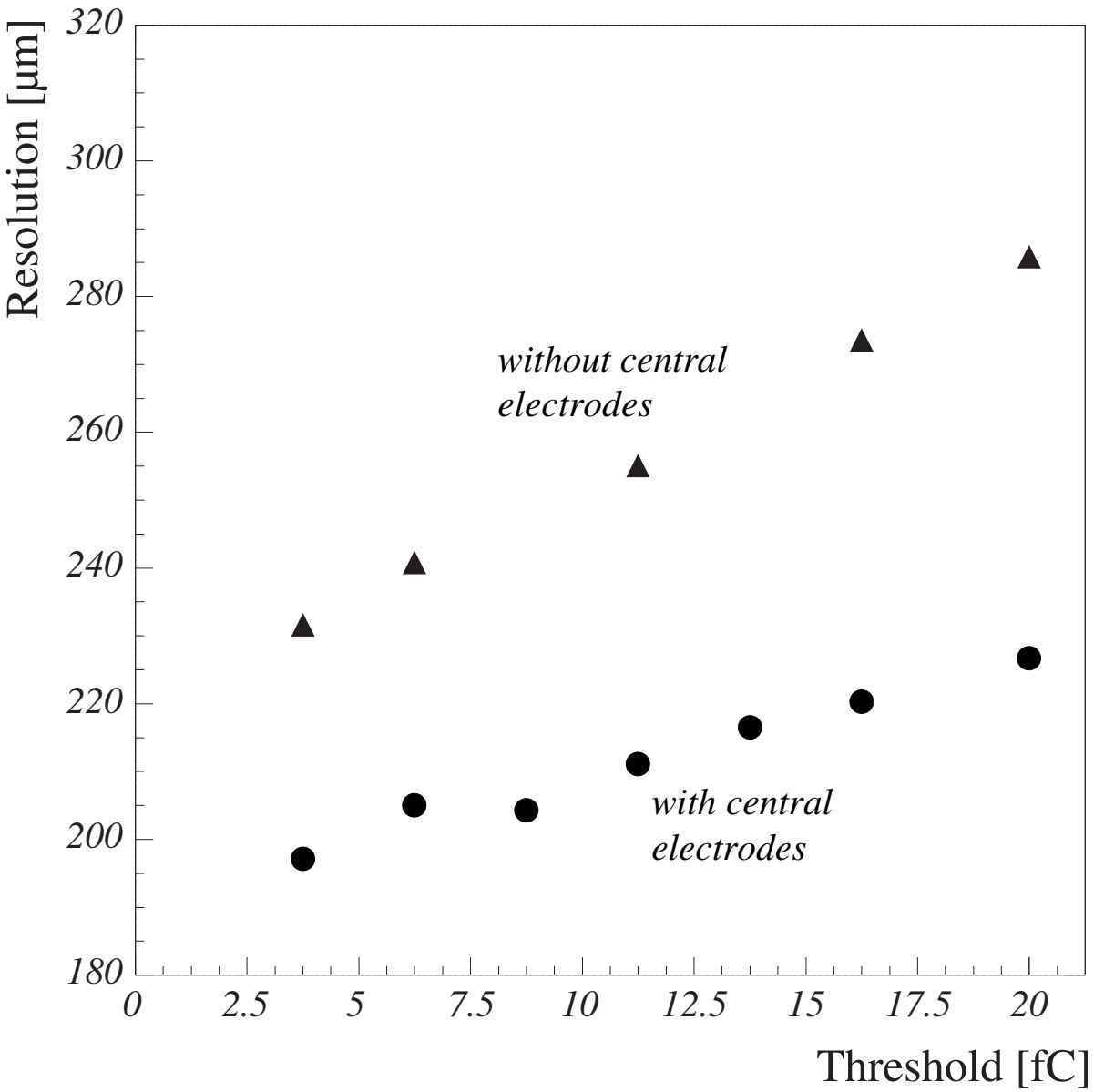

Resolution [μm]
320
300
280
260
240
220
200
180
0
2.5
5
7.5
10
12.5
15
17.5
20
Threshold [fC]
without central electrodes
with central electrodes

Figure no. 23