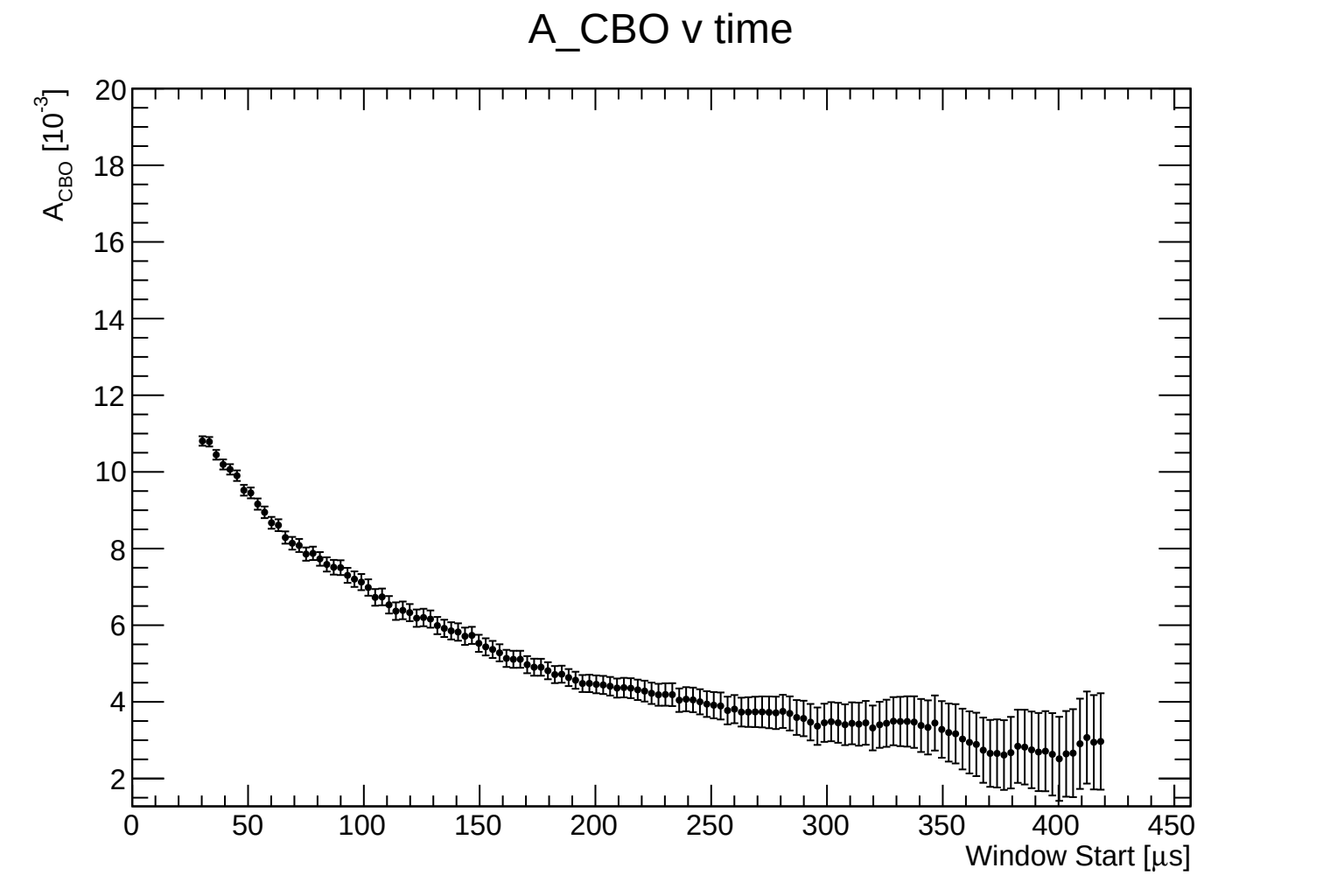
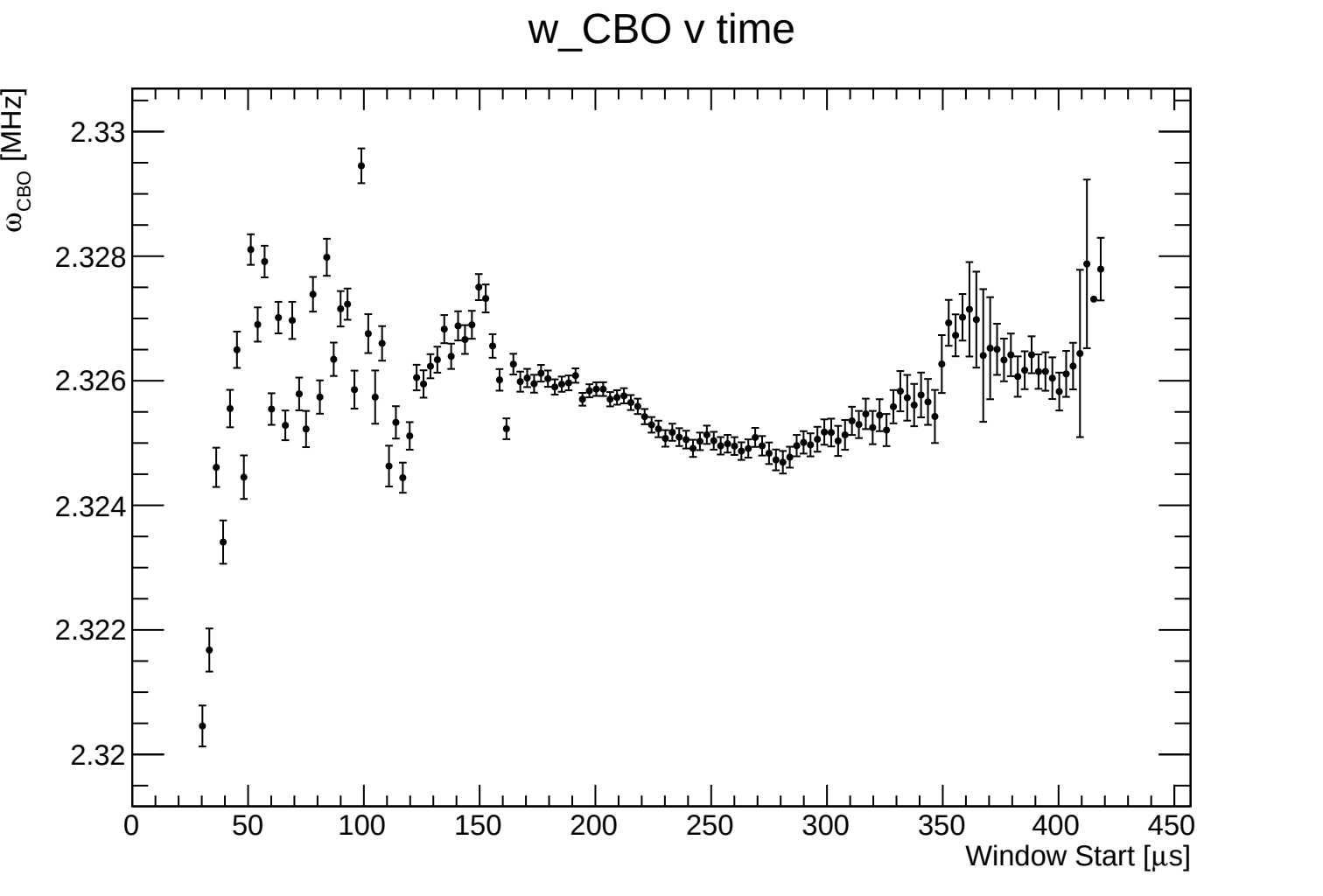
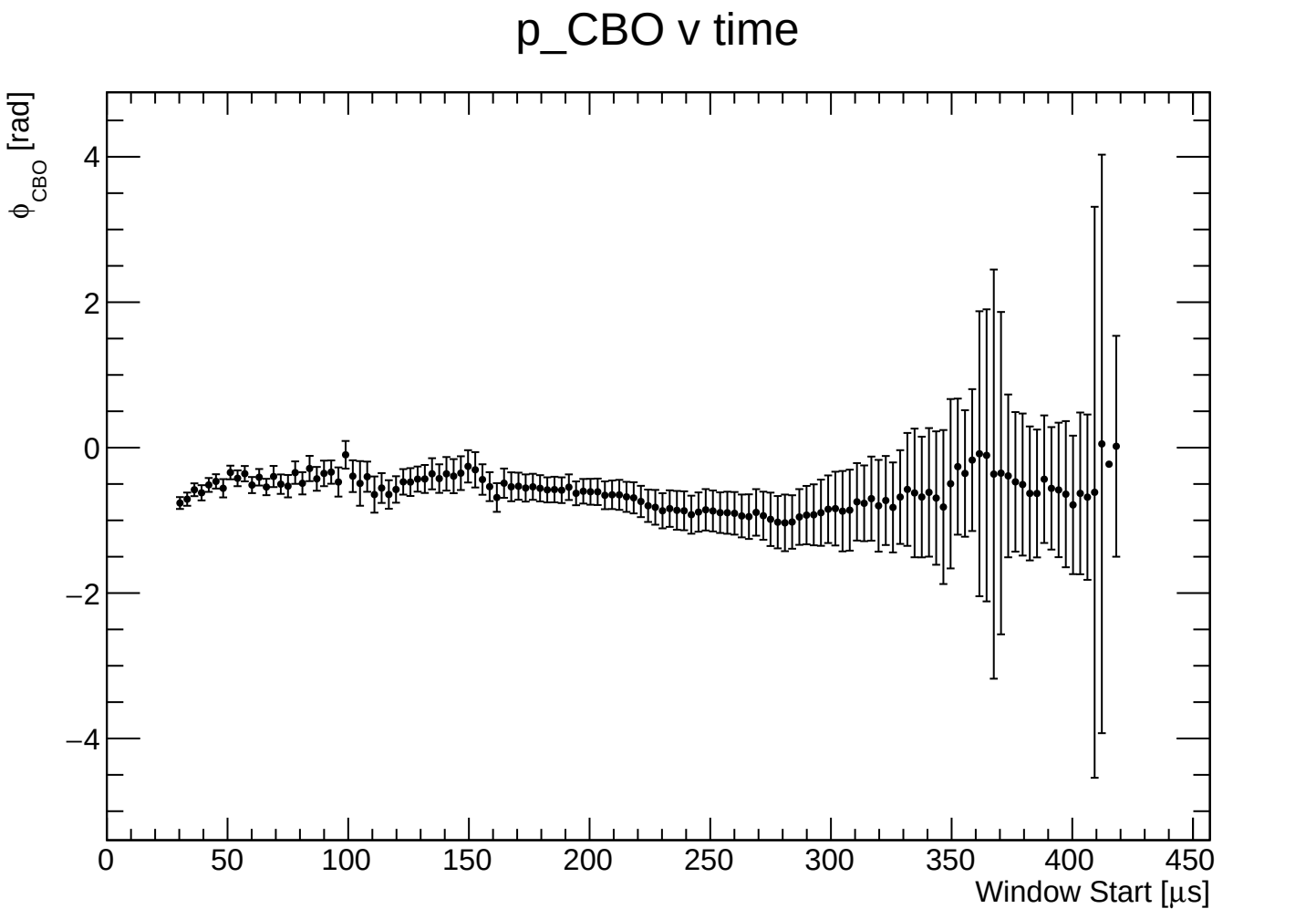
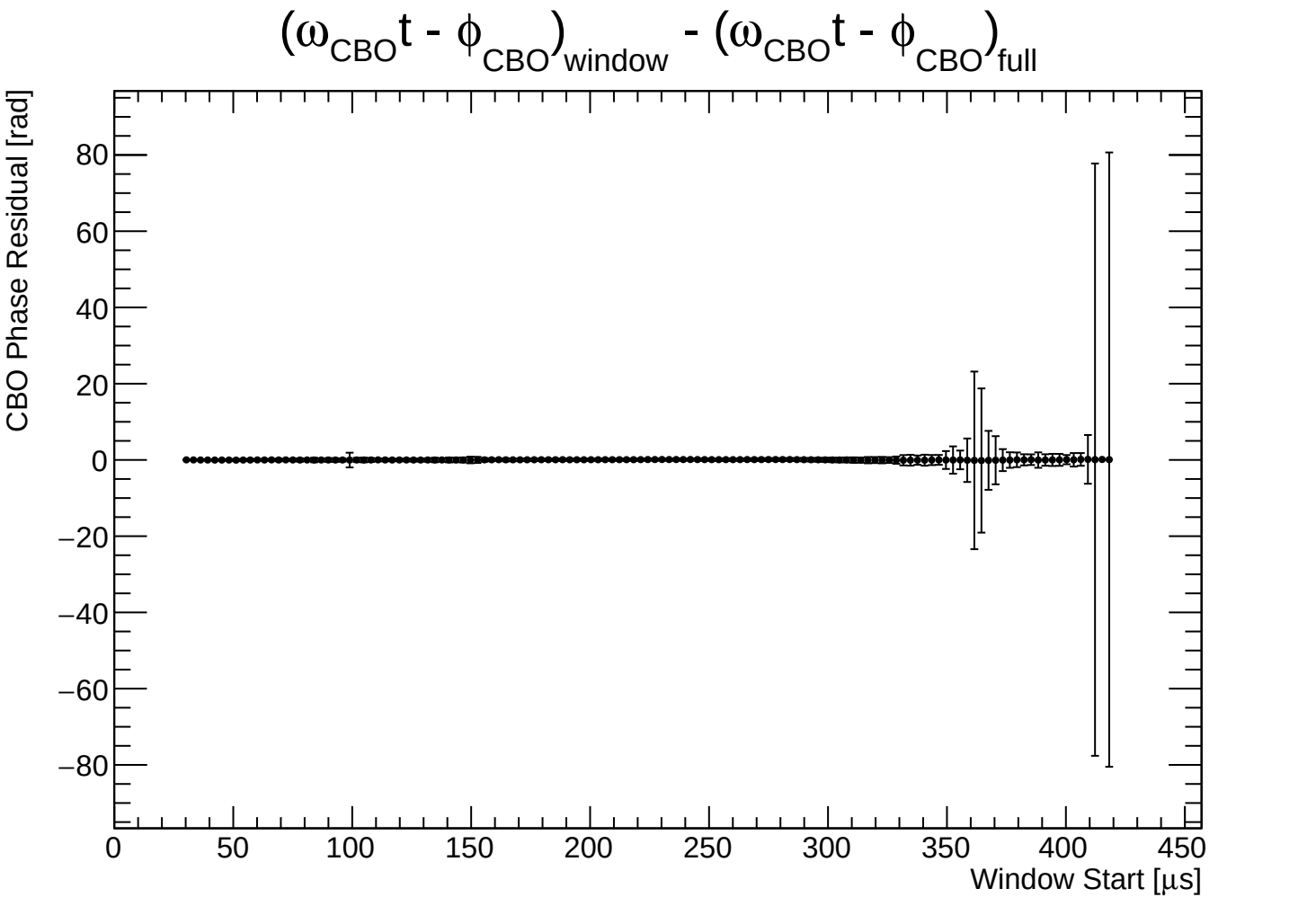
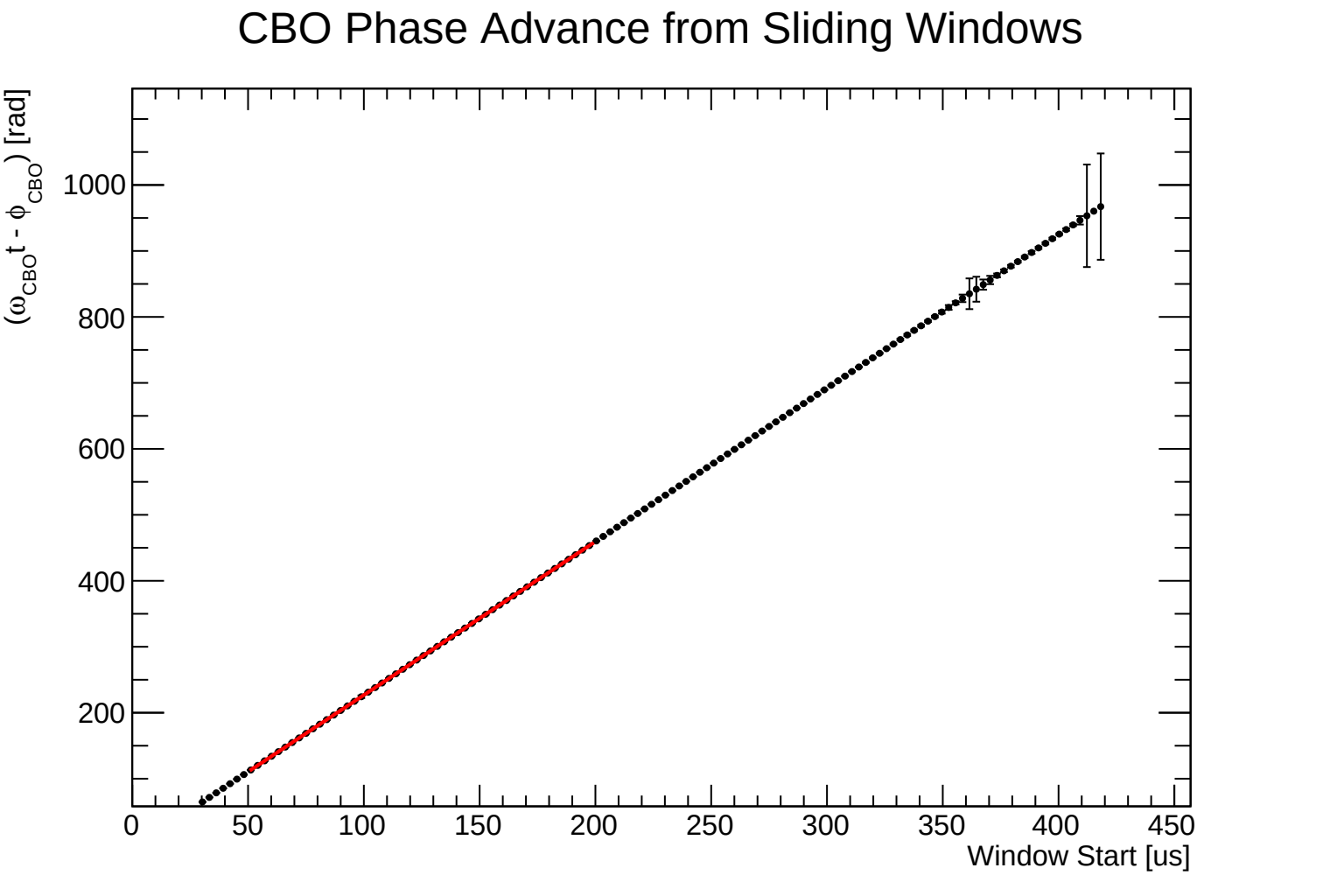
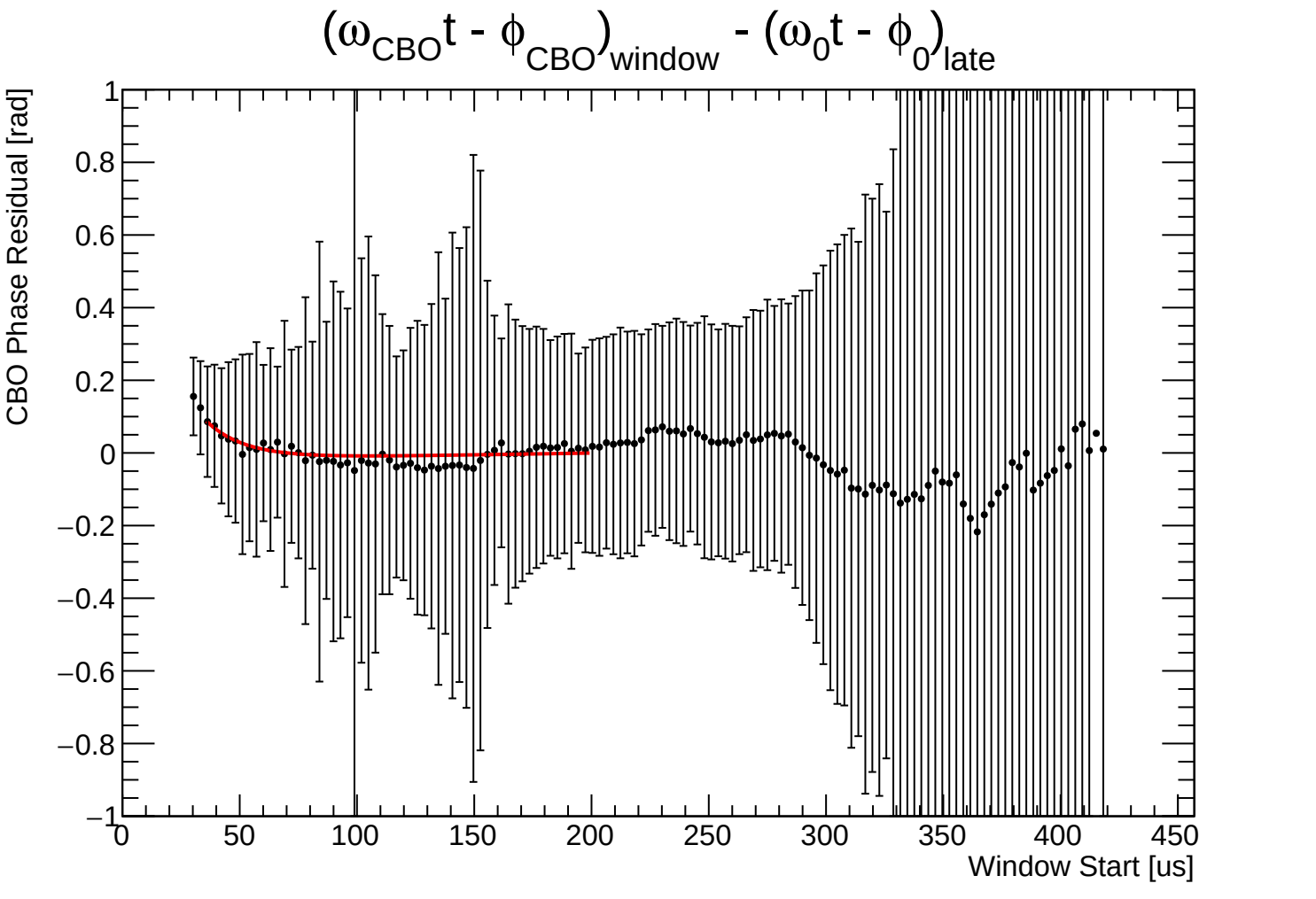

A_CBO v time
$A_{CBO}$ [$10^{-3}$]
20
18
16
14
12
10
8
6
4
2
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

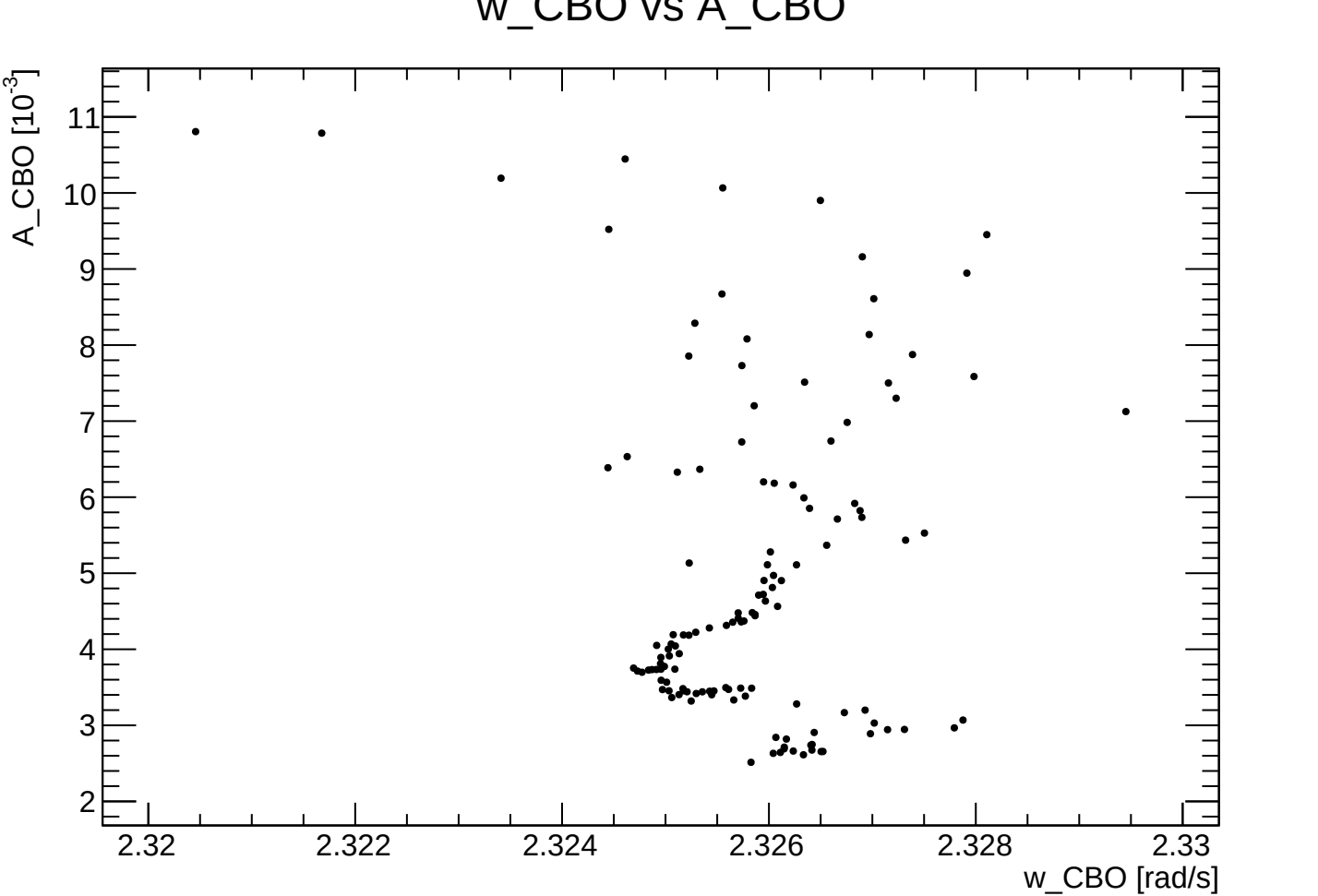

w_CBO v time
$\omega_{CBO}$ [MHz]
2.33
2.328
2.326
2.324
2.322
2.32
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

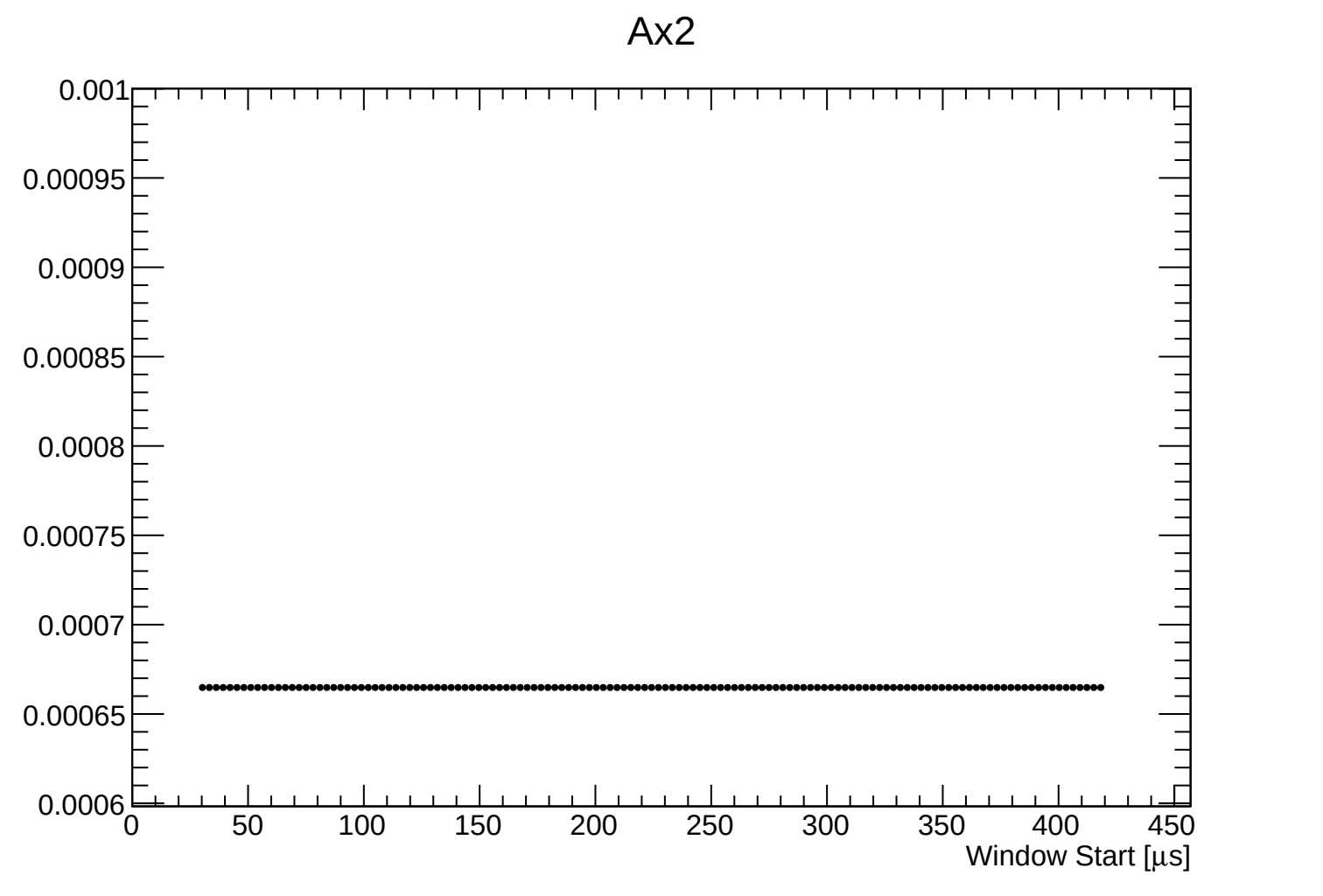

p_CBO v time
$\phi_{CBO}$ [rad]
4
2
0
−2
−4
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

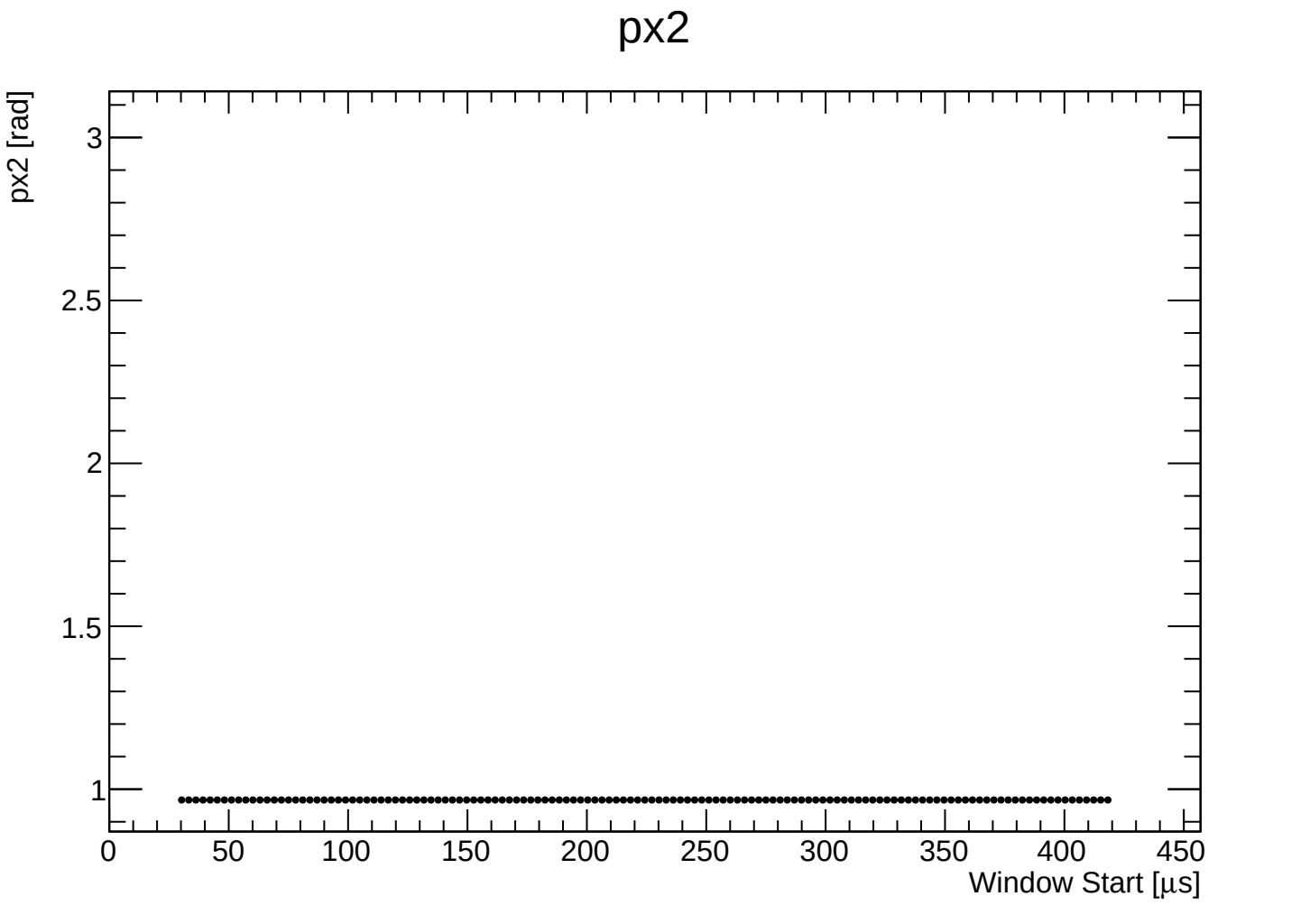

$(\omega_{CBO}t - \phi_{CBO})_{window} - (\omega_{CBO}t - \phi_{CBO})_{full}$
CBO Phase Residual [rad]
80
60
40
20
0
−20
−40
−60
−80
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

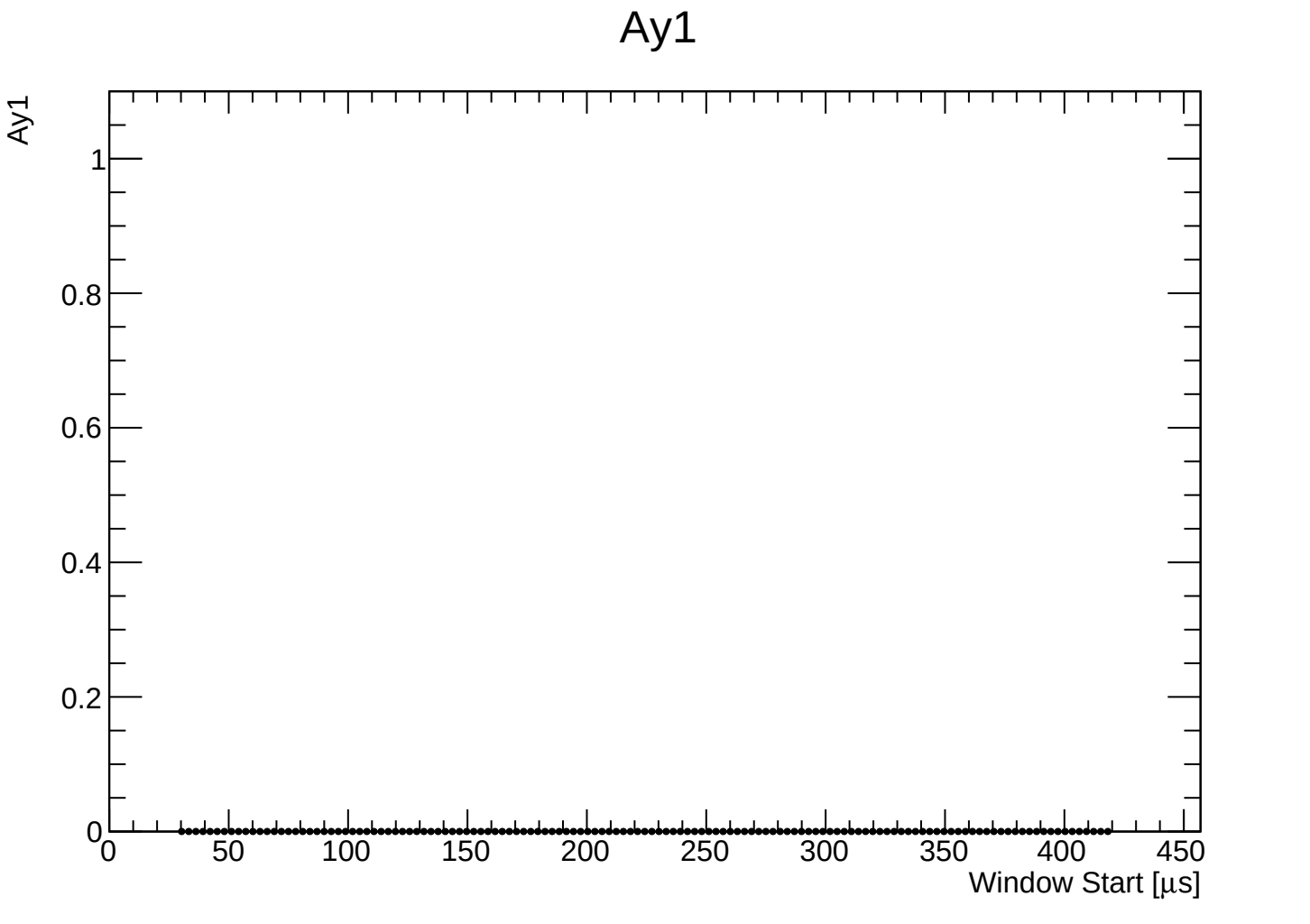

CBO Phase Advance from Sliding Windows
$(\omega_{CBO}t - \phi_{CBO})$ [rad]
1000
800
600
400
200
0
50
100
150
200
250
300
350
400
450
Window Start [us]

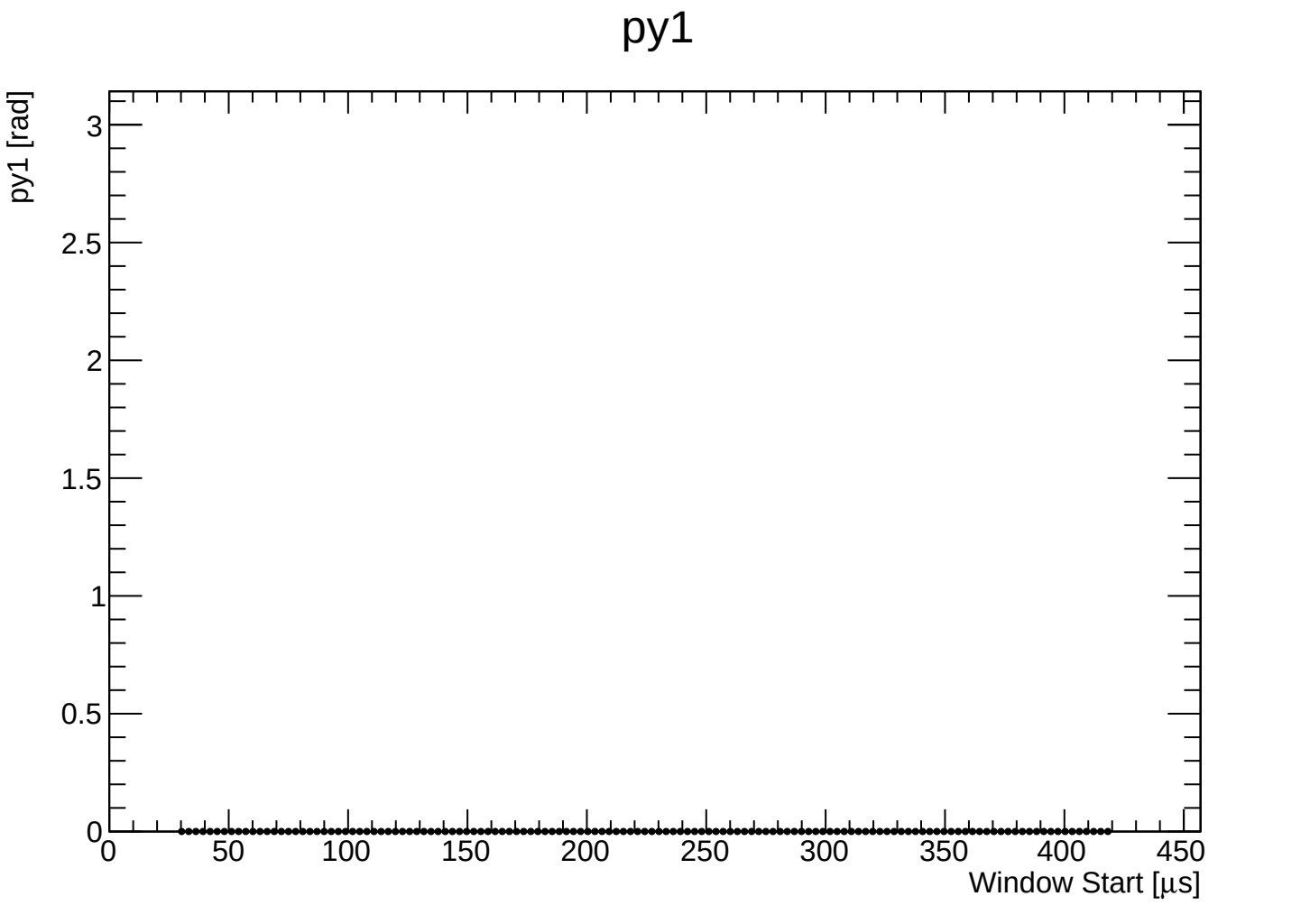

$(\omega_{CBO}t - \phi_{CBO})_{window} - (\omega_0 t - \phi_0)_{late}$
CBO Phase Residual [rad]
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
0
50
100
150
200
250
300
350
400
450
Window Start [us]

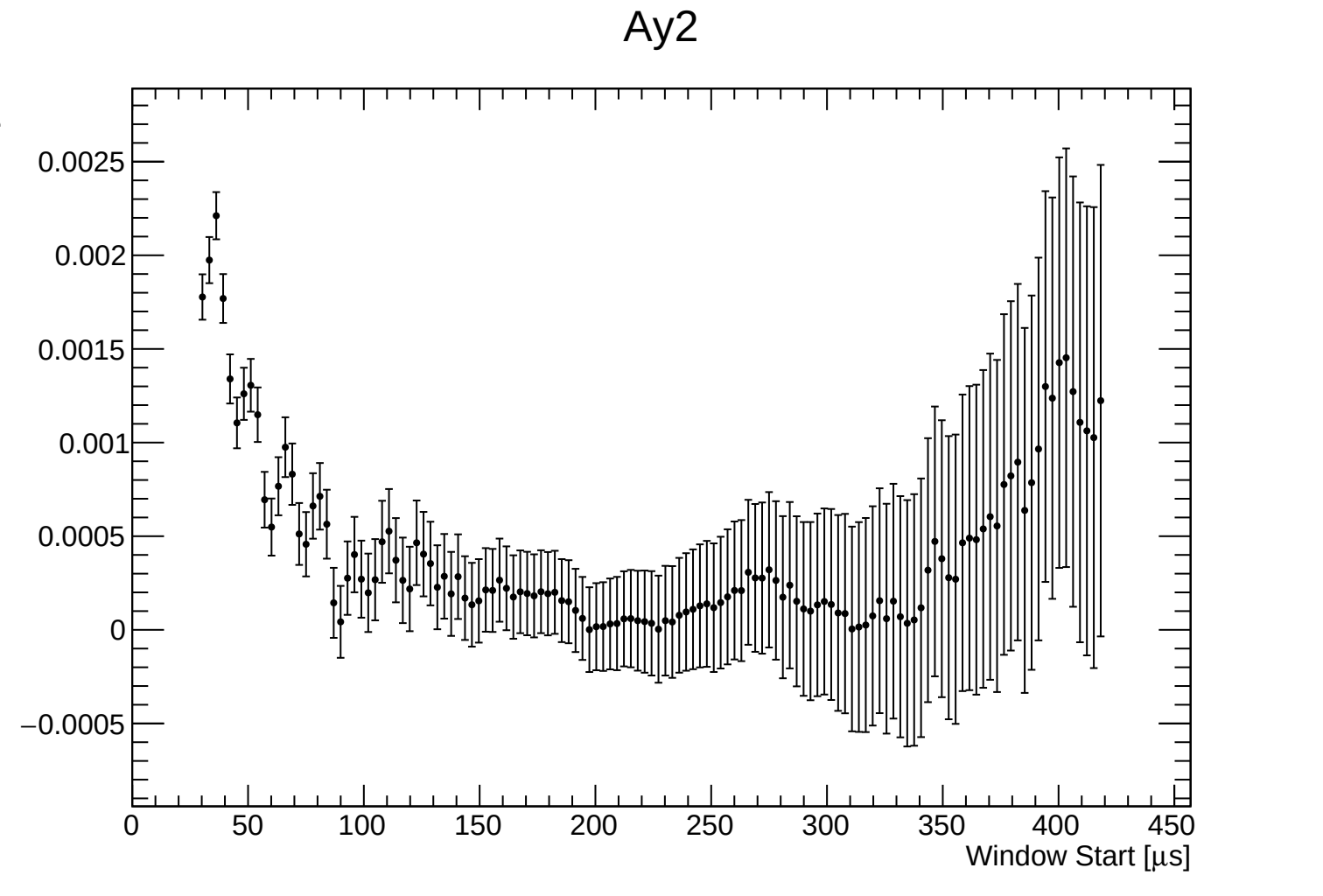

w_CBO vs A_CBO
A_CBO [10^-3]
11
10
9
8
7
6
5
4
3
2
2.32
2.322
2.324
2.326
2.328
2.33
w_CBO [rad/s]

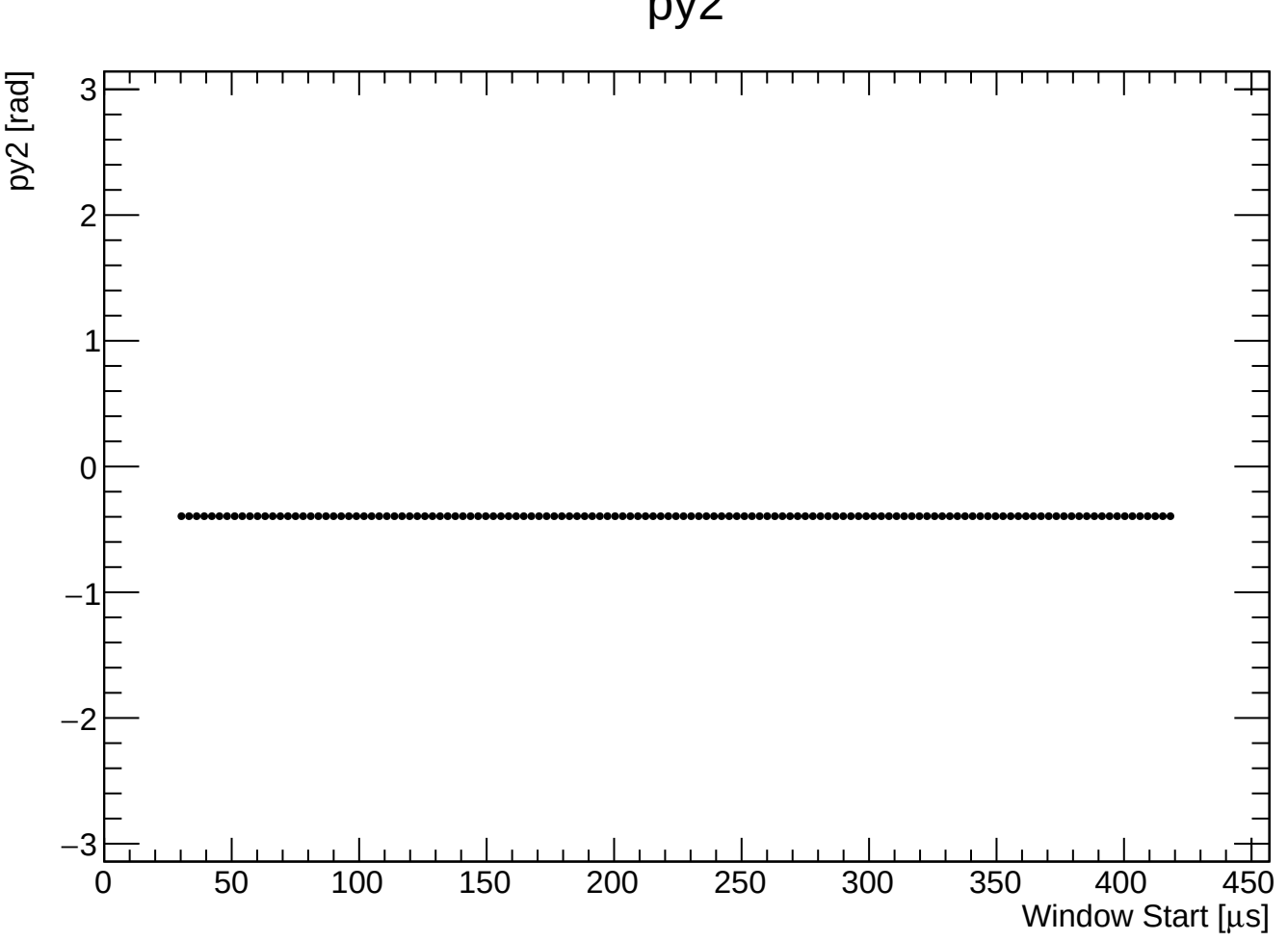

Ax2
0.001
0.00095
0.0009
0.00085
0.0008
0.00075
0.0007
0.00065
0.0006
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

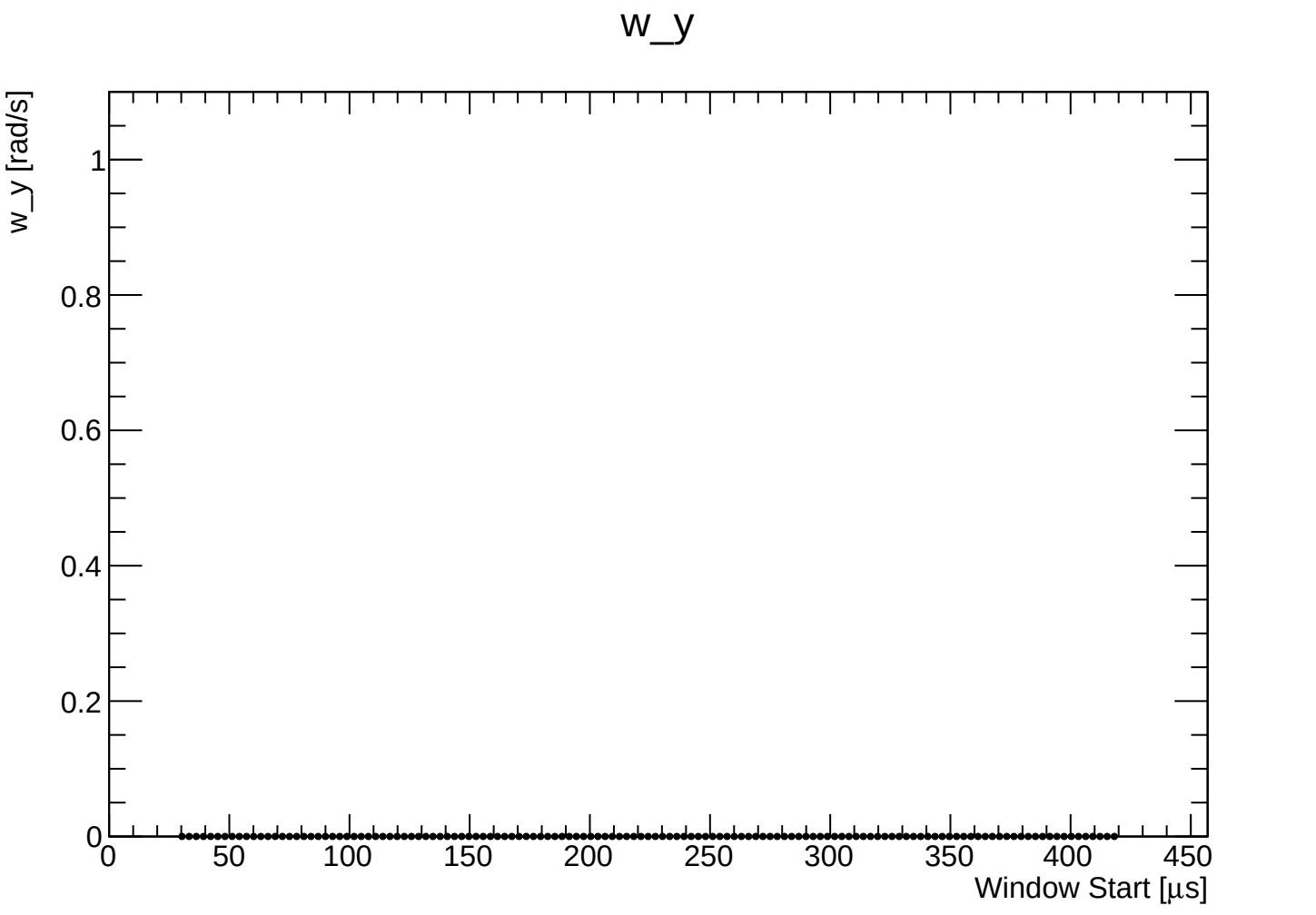

px2
px2 [rad]
3
2.5
2
1.5
1
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

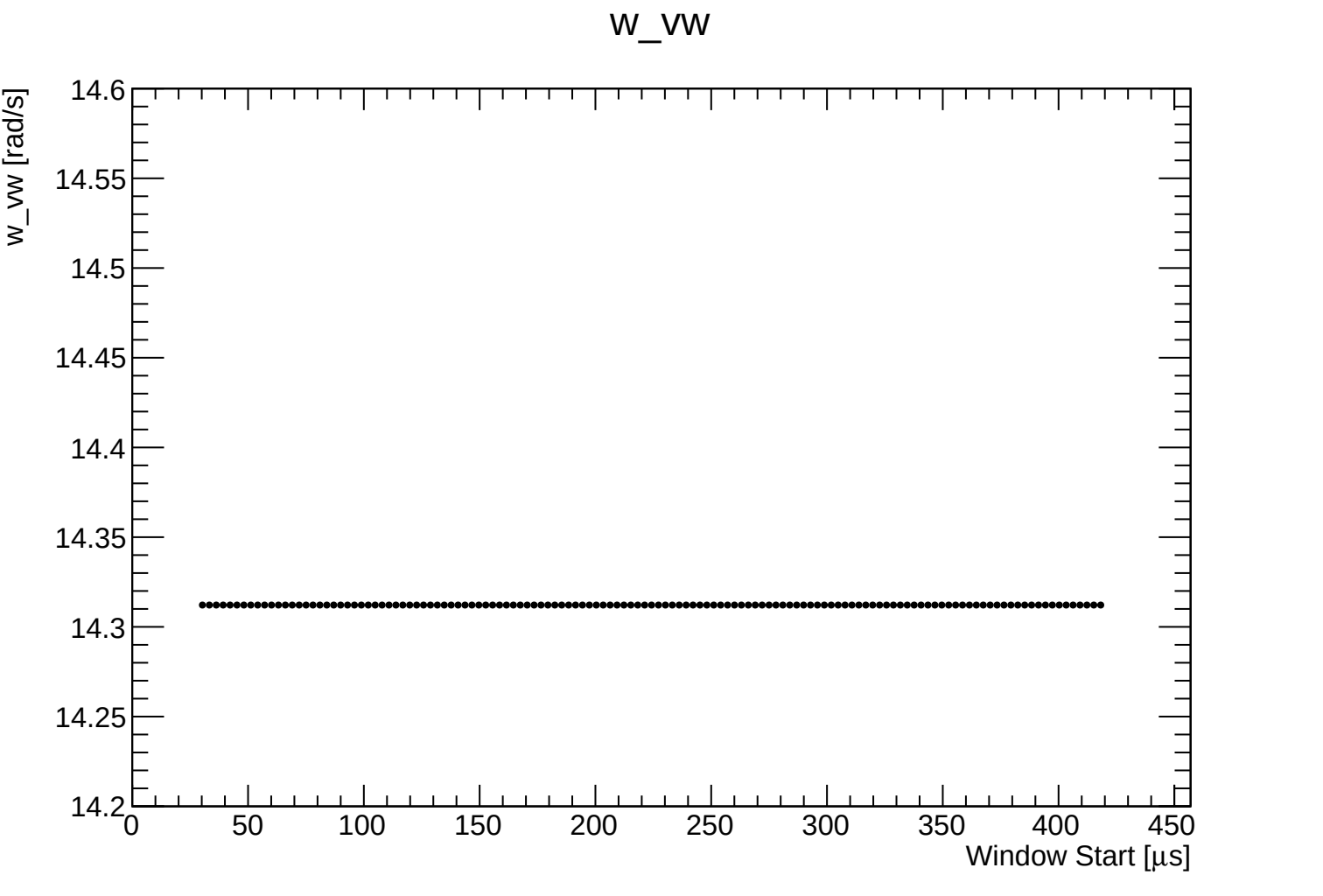

Ay1
Ay1
1
0.8
0.6
0.4
0.2
0
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

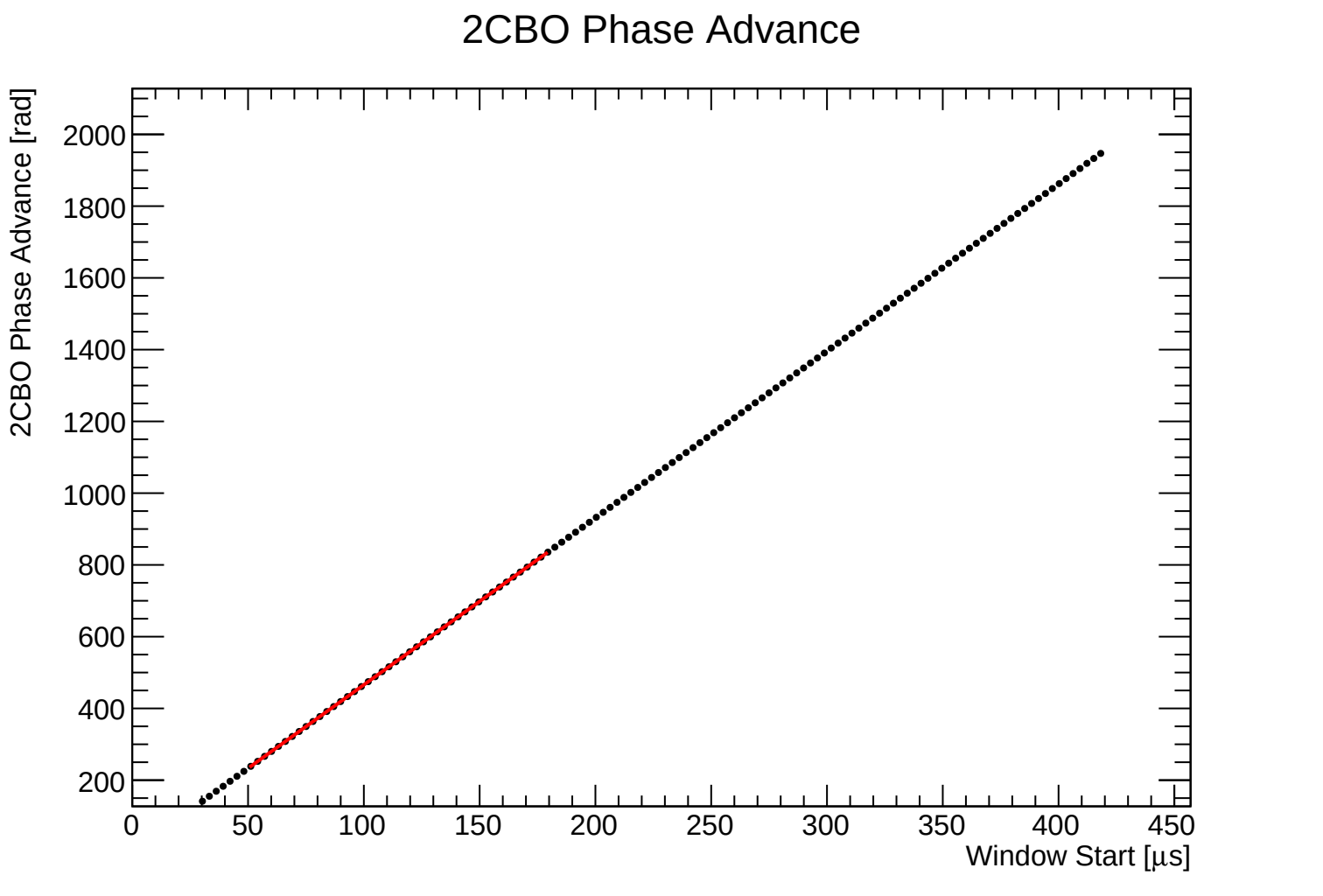

py1
py1 [rad]
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

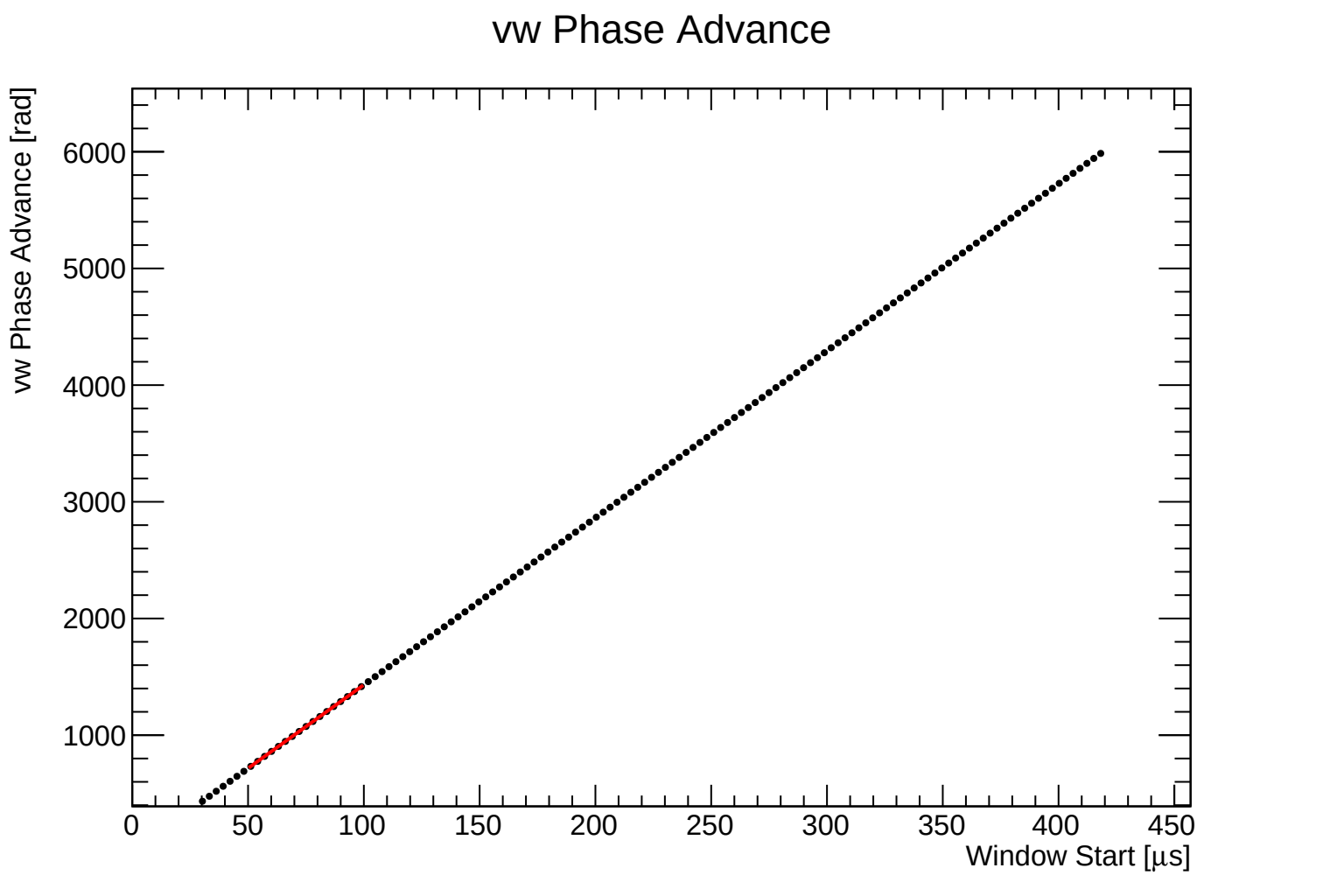

Ay2
0.0025
0.002
0.0015
0.001
0.0005
0
−0.0005
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

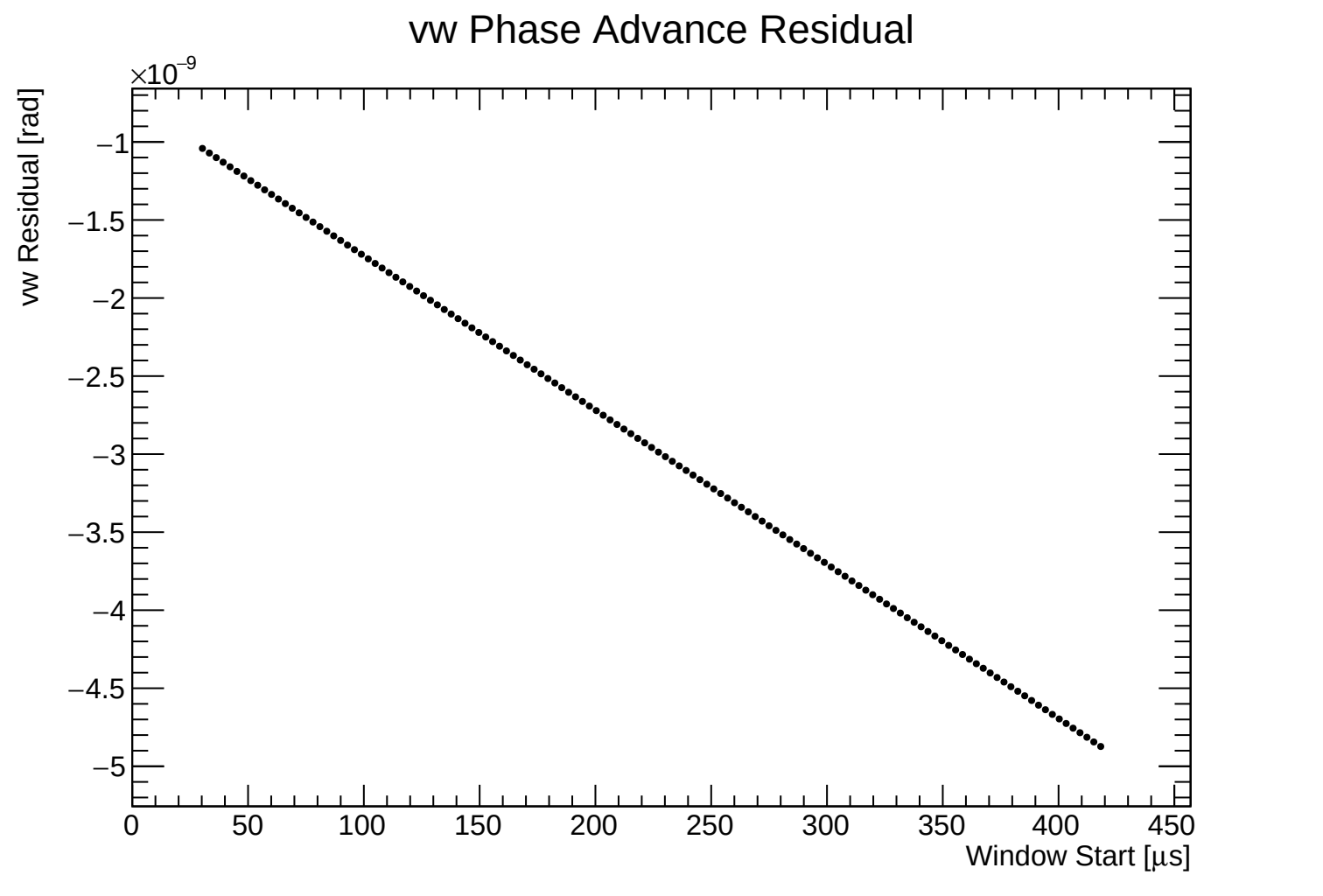

py2
py2 [rad]
3
2
1
0
−1
−2
−3
0
50
100
150
200
250
300
350
400
450
Window Start [μs]

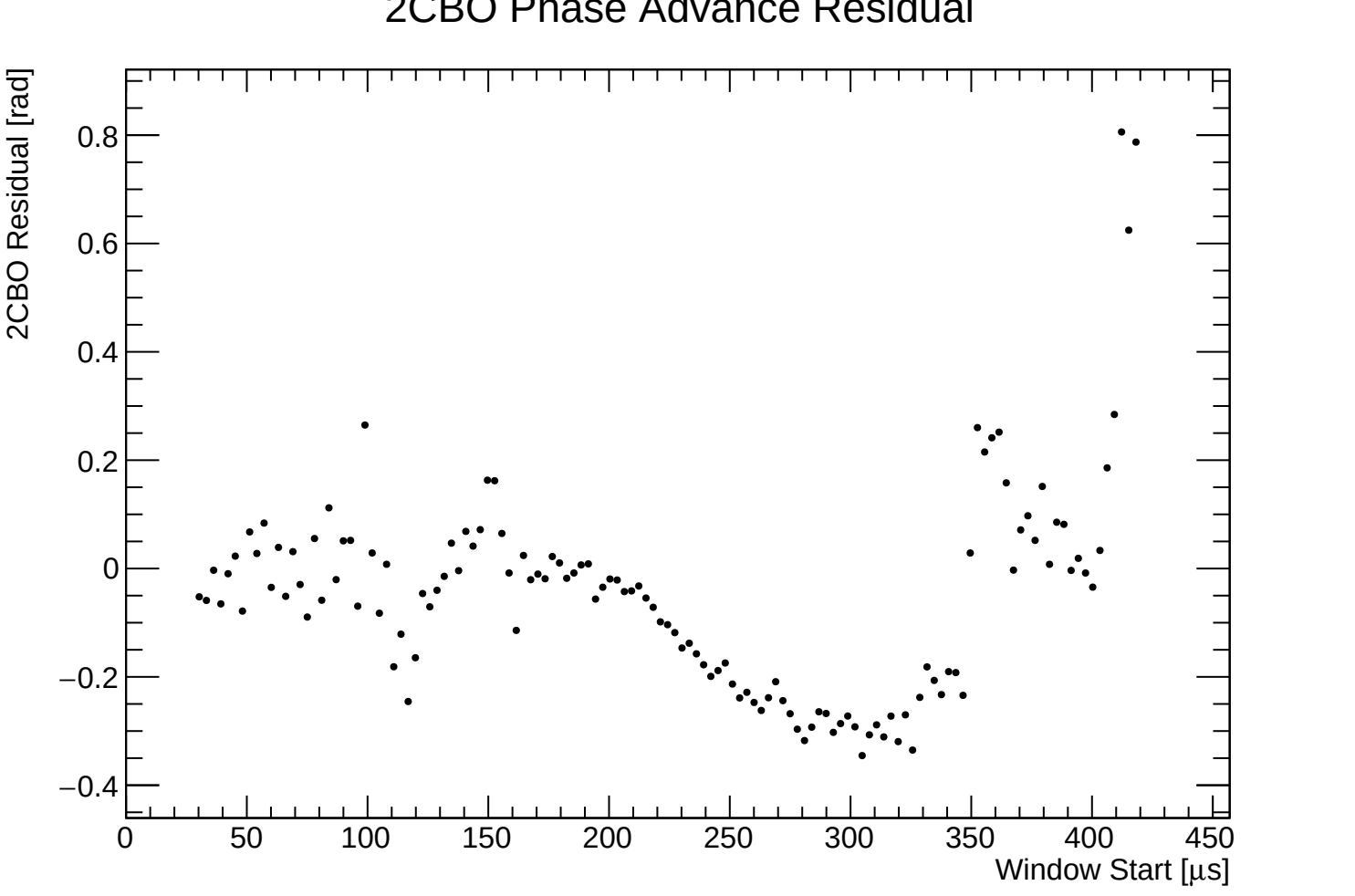

w_y
w_y [rad/s]
1
0.8
0.6
0.4
0.2
0
0
50
100
150
200
250
300
350
400
450
Window Start [μs]


W_VW
w_vw [rad/s]
14.6
14.55
14.5
14.45
14.4
14.35
14.3
14.25
14.2
0
50
100
150
200
250
300
350
400
450
Window Start [μs]


2CBO Phase Advance
2CBO Phase Advance [rad]
2000
1800
1600
1400
1200
1000
800
600
400
200
0
50
100
150
200
250
300
350
400
450
Window Start [μs]


vw Phase Advance
vw Phase Advance [rad]
6000
5000
4000
3000
2000
1000
0
50
100
150
200
250
300
350
400
450
Window Start [μs]


vw Phase Advance Residual
×10⁻⁹
vw Residual [rad]
−1
−1.5
−2
−2.5
−3
−3.5
−4
−4.5
−5
0
50
100
150
200
250
300
350
400
450
Window Start [μs]


2CBO Phase Advance Residual
2CBO Residual [rad]
0.8
0.6
0.4
0.2
0
−0.2
−0.4
0
50
100
150
200
250
300
350
400
450
Window Start [μs]