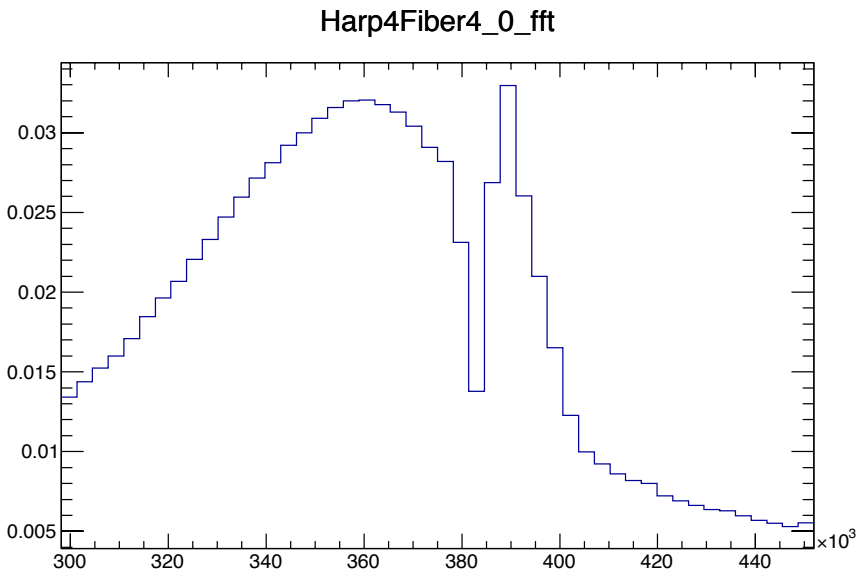
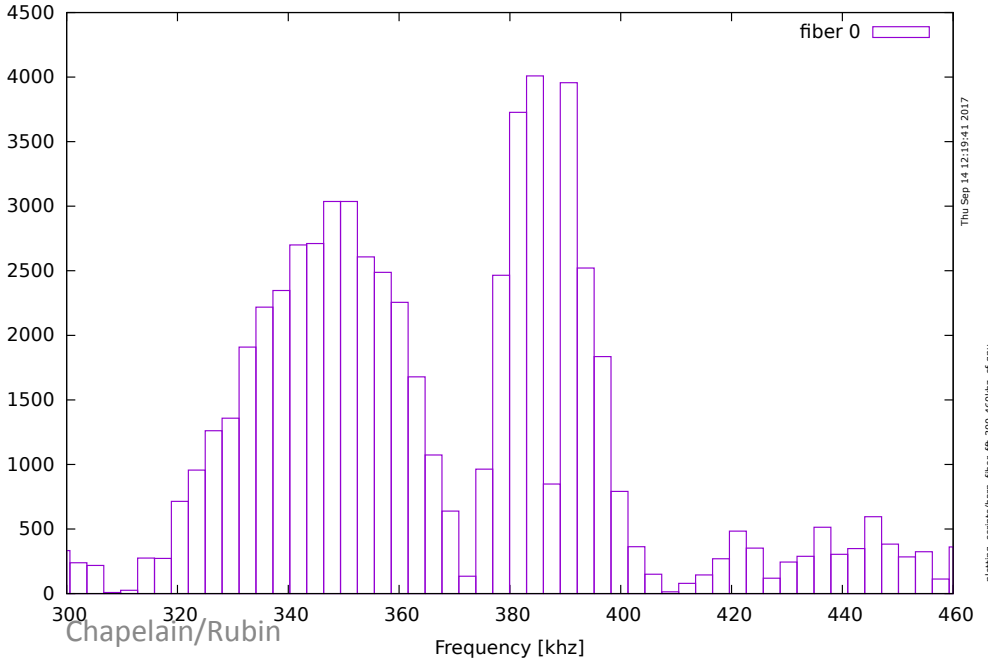
Fiber Harp Measurement and Simulation

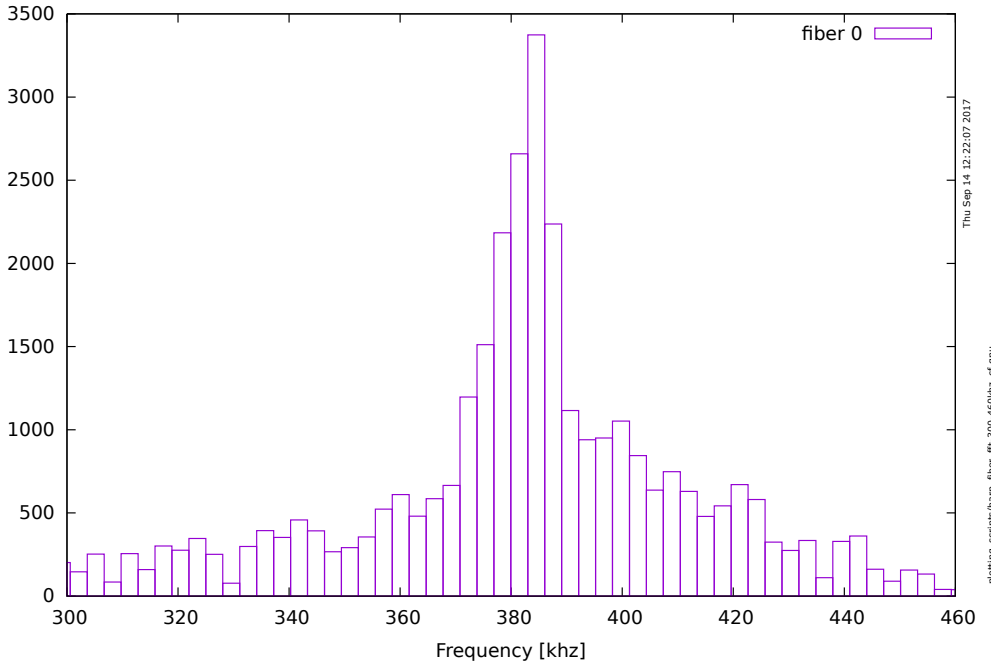
Chapelain and Rubin

September 21, 2017

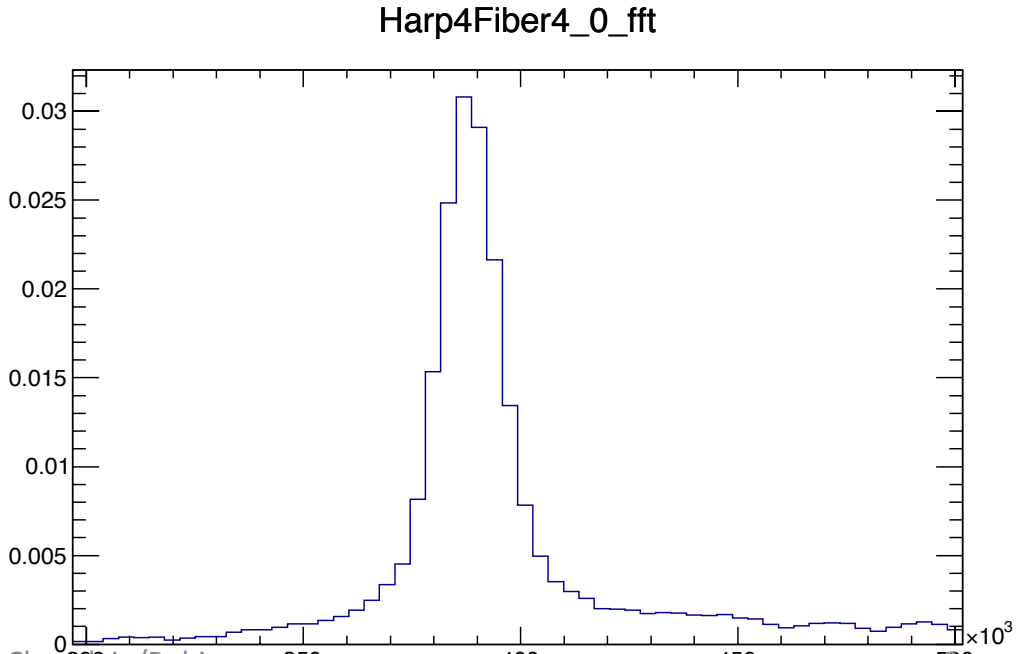


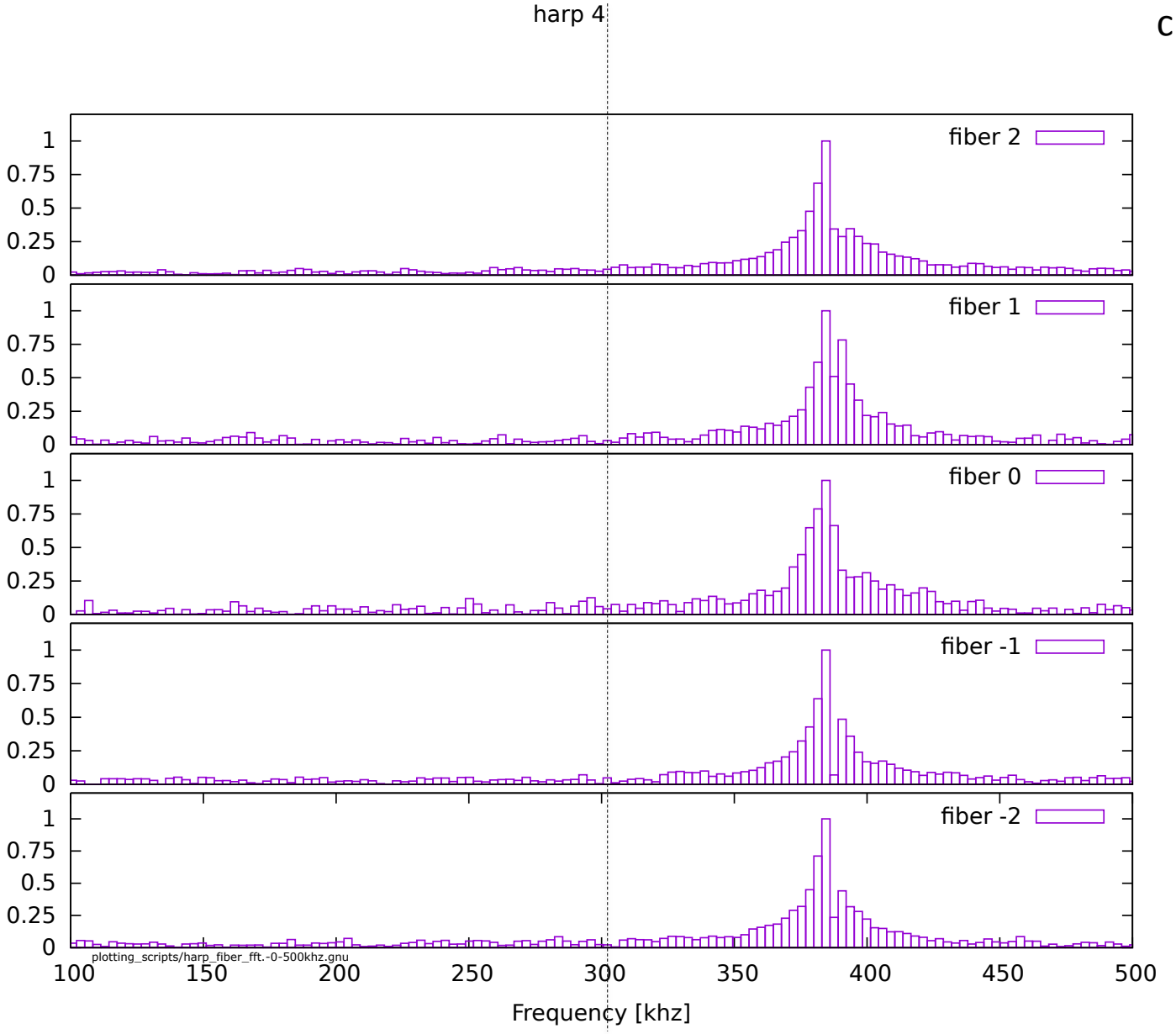
CBO – fft starting at 6us

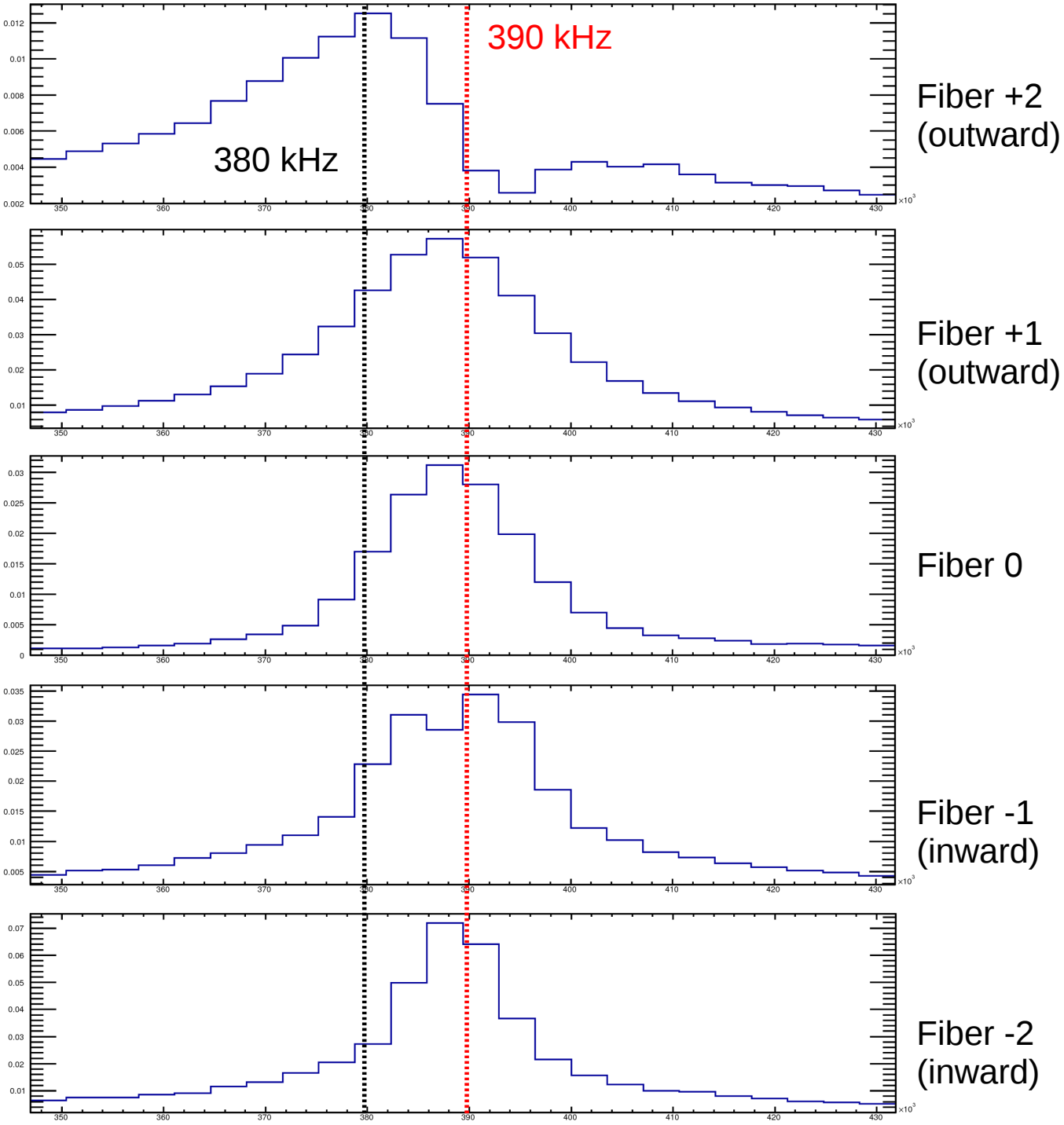


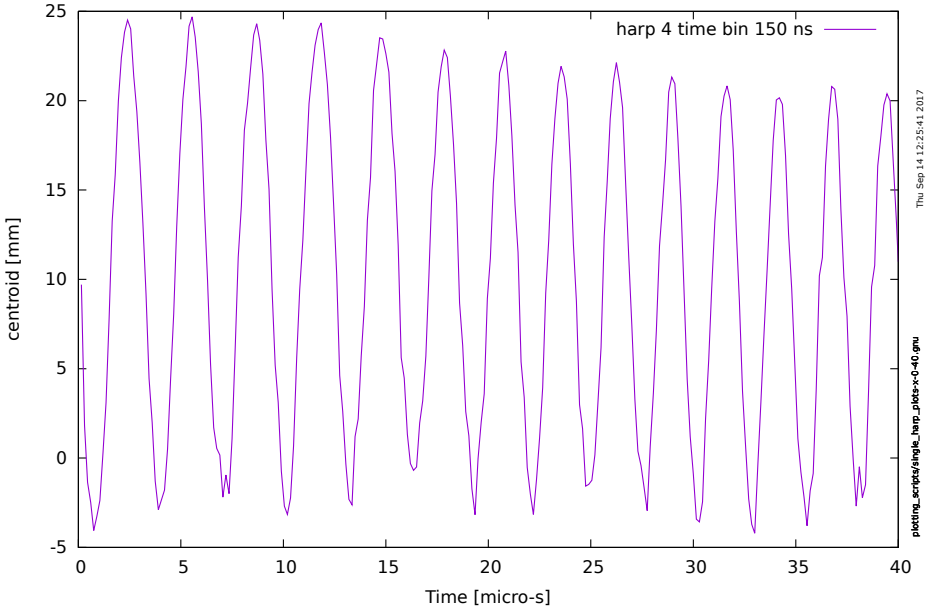


cbo after 35 us

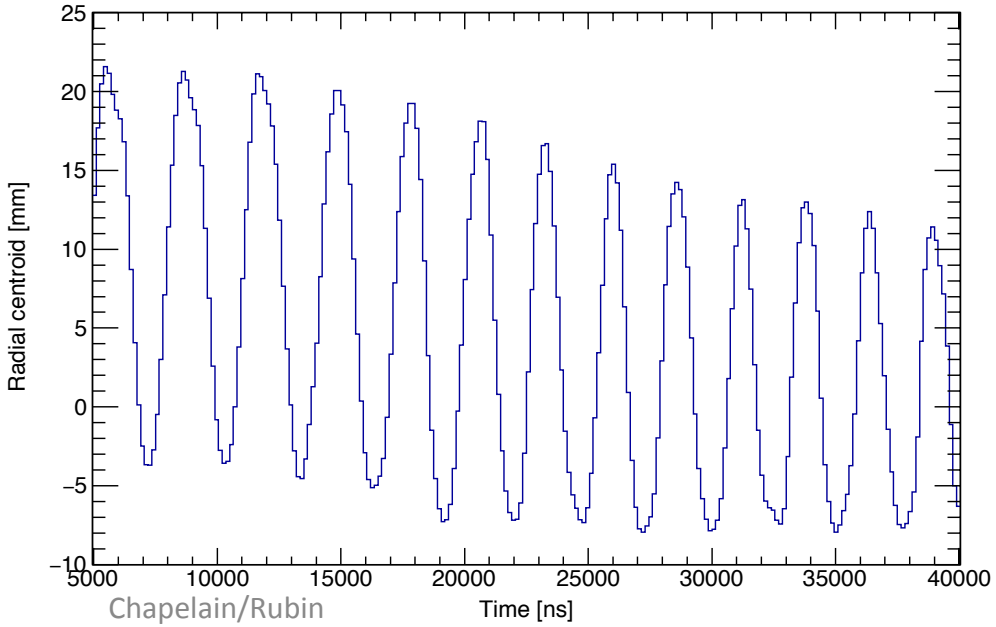


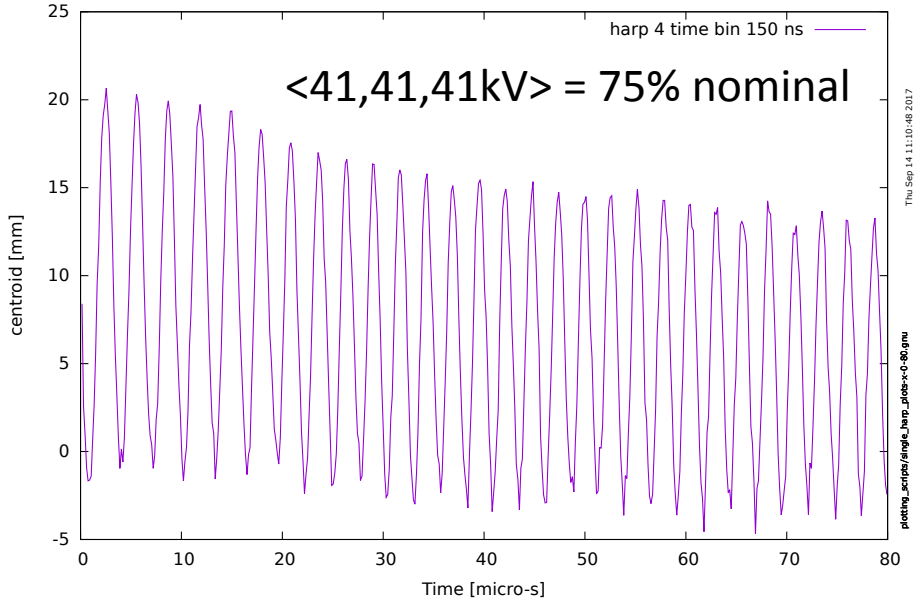

harp 4
fiber 2
fiber 1
fiber 0
fiber -1
fiber -2
1
0.75
0.5
0.25
0
plotting_scripts/harp_fiber_fft.-0-500khz.gnu
100
150
200
250
300
350
400
450
500
Frequency [khz]

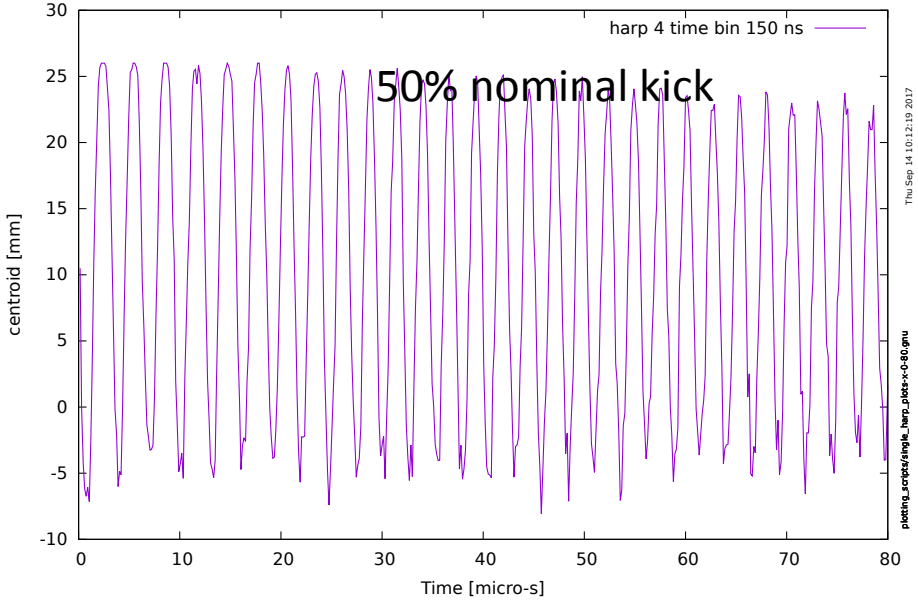

390 kHz
380 kHz
Fiber +2
(outward)
Fiber +1
(outward)
Fiber 0
Fiber -1
(inward)
Fiber -2
(inward)

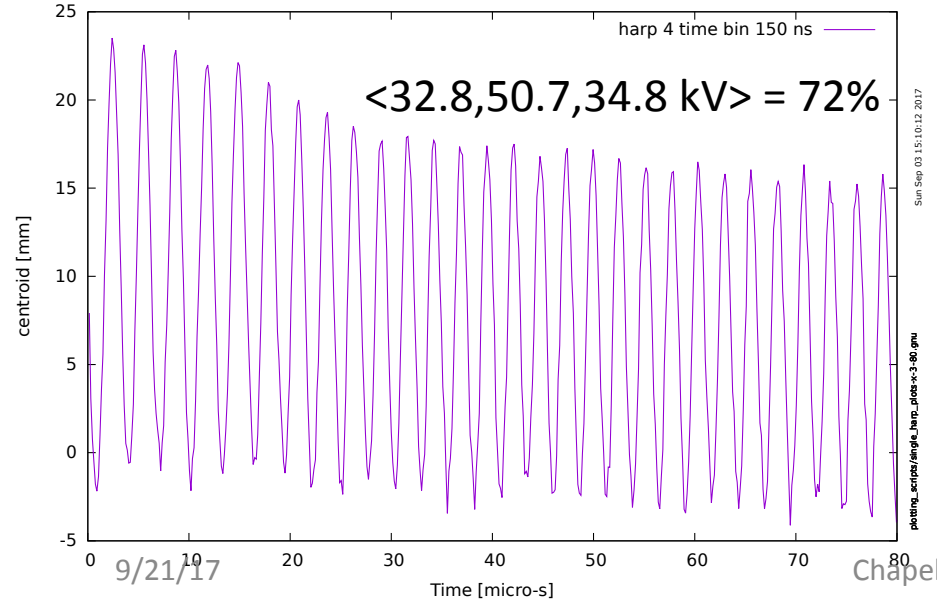

harp 4 time bin 150 ns
centroid [mm]
Time [micro-s]
Thu Sep 14 12:25:41 2017
plotting_scripts/single_harp_plots-x-0-40.gnu

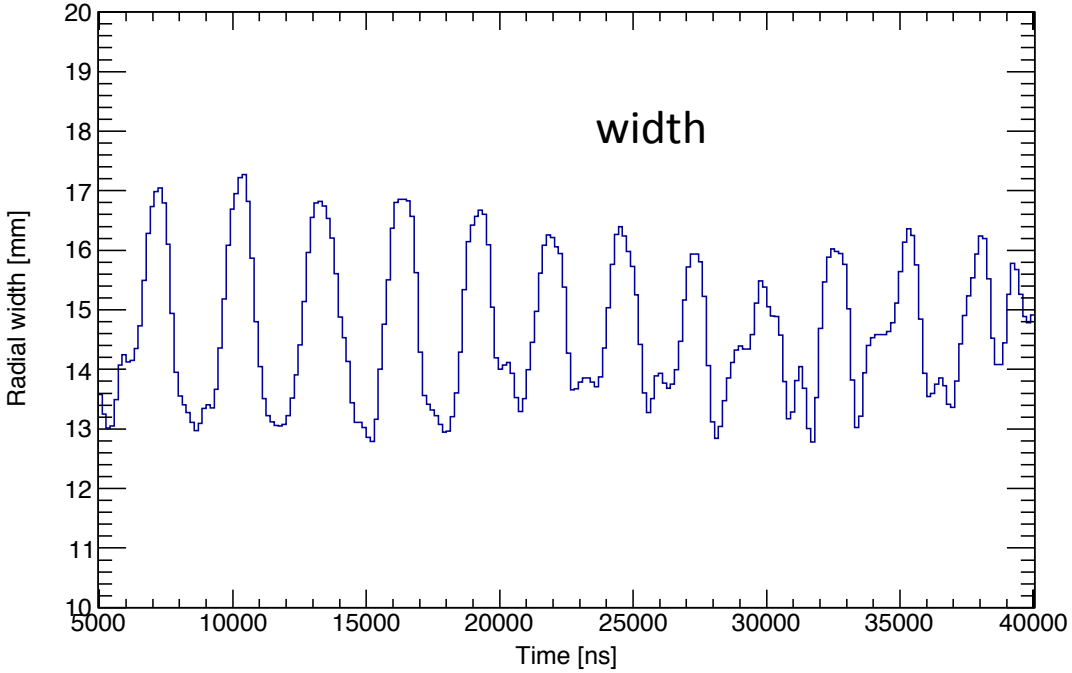
centroid

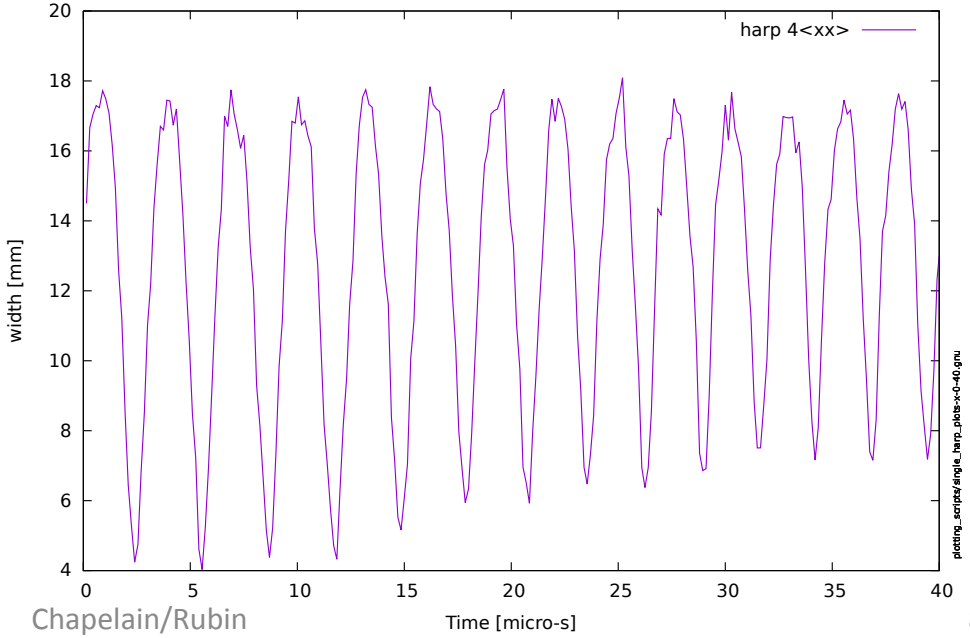

Radial centroid [mm]
Time [ns]

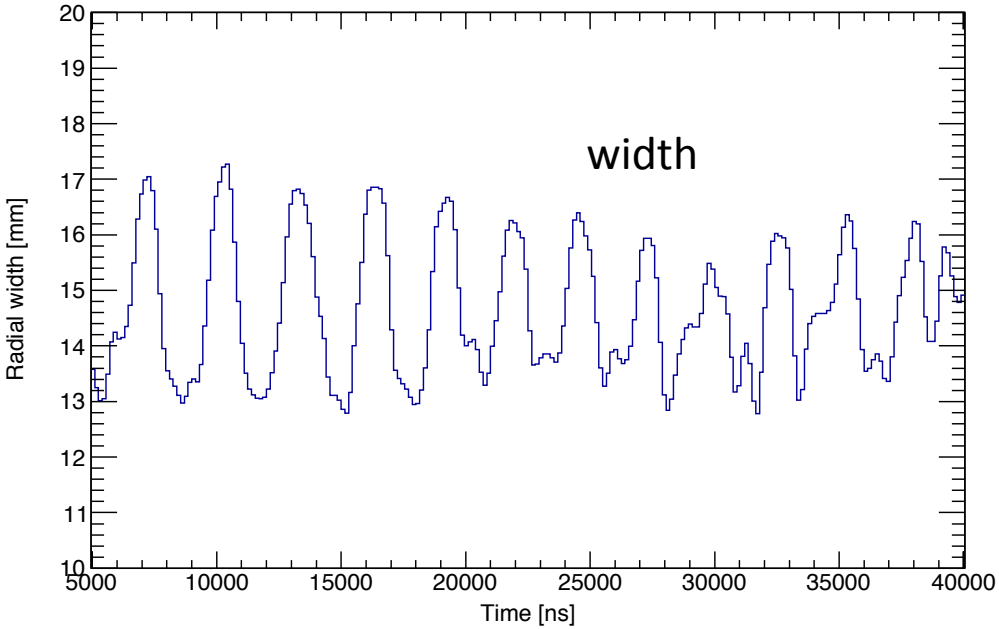

harp 4 time bin 150 ns
<41,41,41kV> = 75% nominal
centroid [mm]
Time [micro-s]
Thu Sep 14 11:10:48 2017
plotting_scripts/angle_harp_plots-x-0-80.gnu


harp 4 time bin 150 ns
50% nominal kick
centroid [mm]
Time [micro-s]
Thu Sep 14 10:12:19 2017
plotting_scripts/angle_harp_plots-x-0-80.gnu

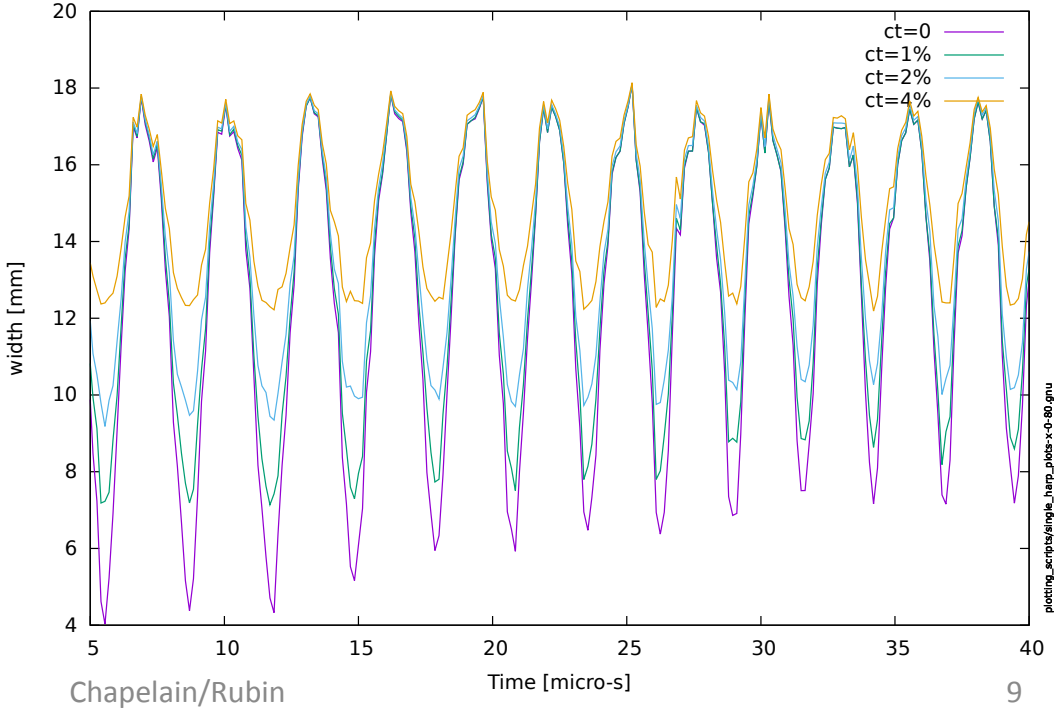

harp 4 time bin 150 ns
<32.8,50.7,34.8 kV> = 72%
centroid [mm]
Time [micro-s]
Sun Sep 03 15:10:12 2017
plotting_scripts/angle_harp_plots-x-3-80.gnu

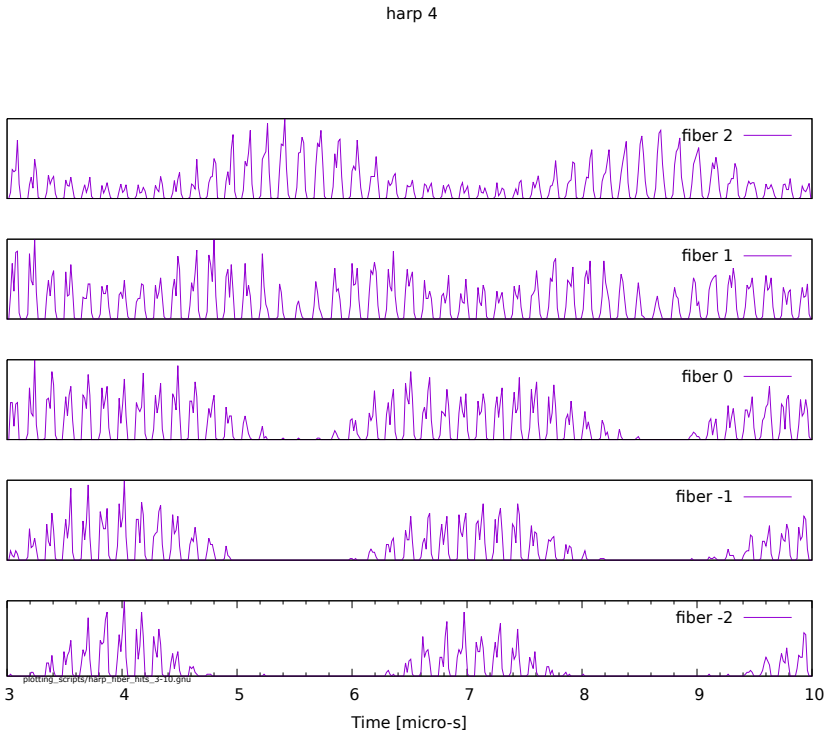

width
Radial width [mm]
Time [ns]
20
19
18
17
16
15
14
13
12
11
10
5000
10000
15000
20000
25000
30000
35000
40000


harp 4<xx>
width [mm]
Time [micro-s]
20
18
16
14
12
10
8
6
4
0
5
10
15
20
25
30
35
40


width
Radial width [mm]
Time [ns]
20
19
18
17
16
15
14
13
12
11
10
5000
10000
15000
20000
25000
30000
35000
40000

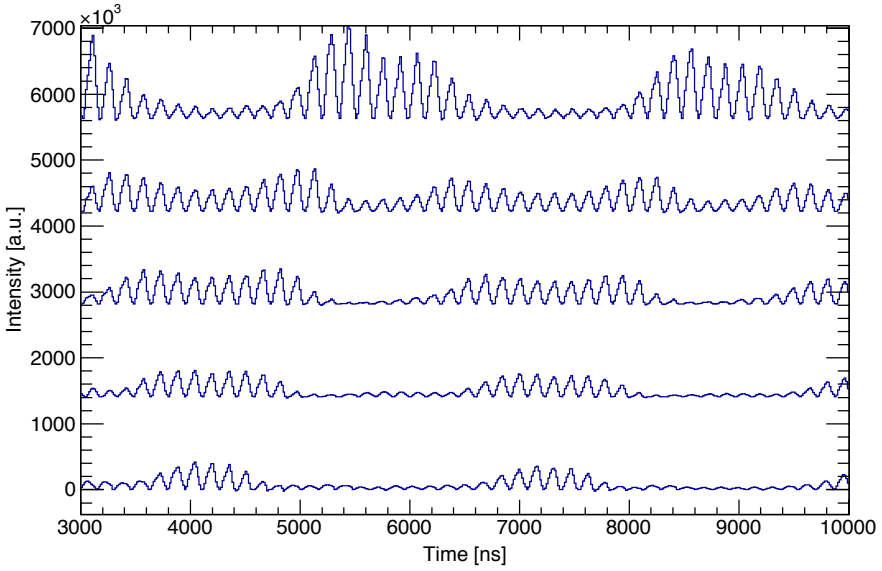
Cross talk ?

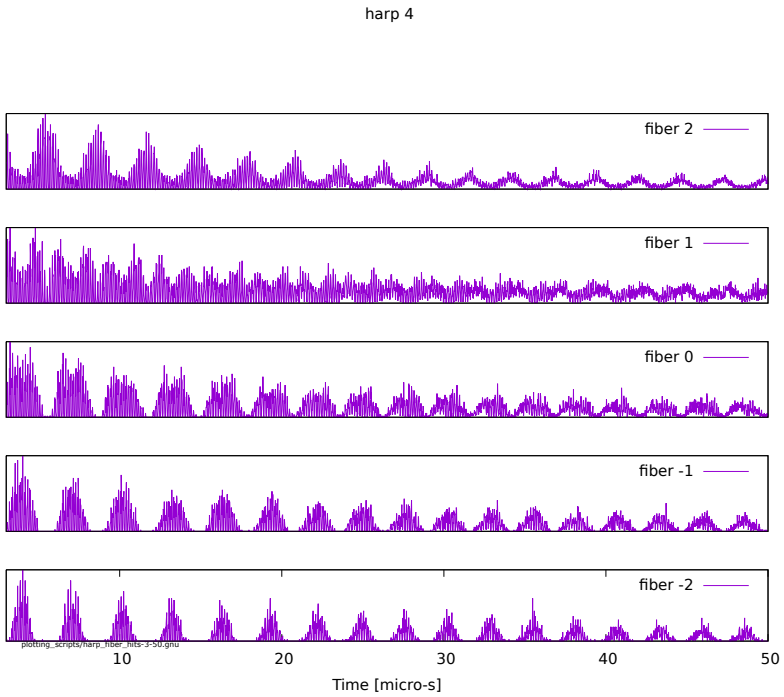

ct=0
ct=1%
ct=2%
ct=4%
width [mm]
Time [micro-s]
20
18
16
14
12
10
8
6
4
5
10
15
20
25
30
35
40
plotting_scripts/single_harp_plots-x-0-80.gnu



Individual fibers

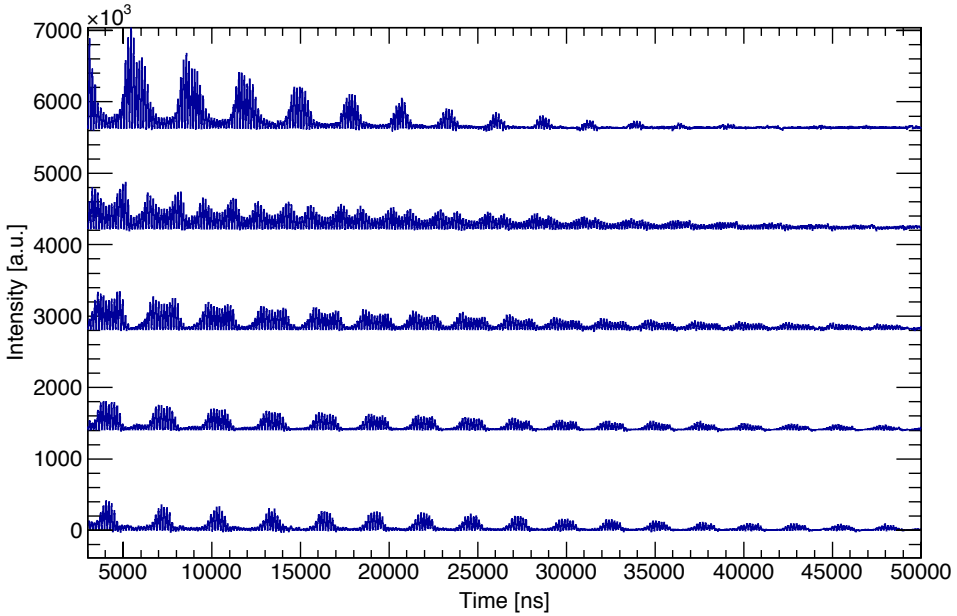
3-10 us

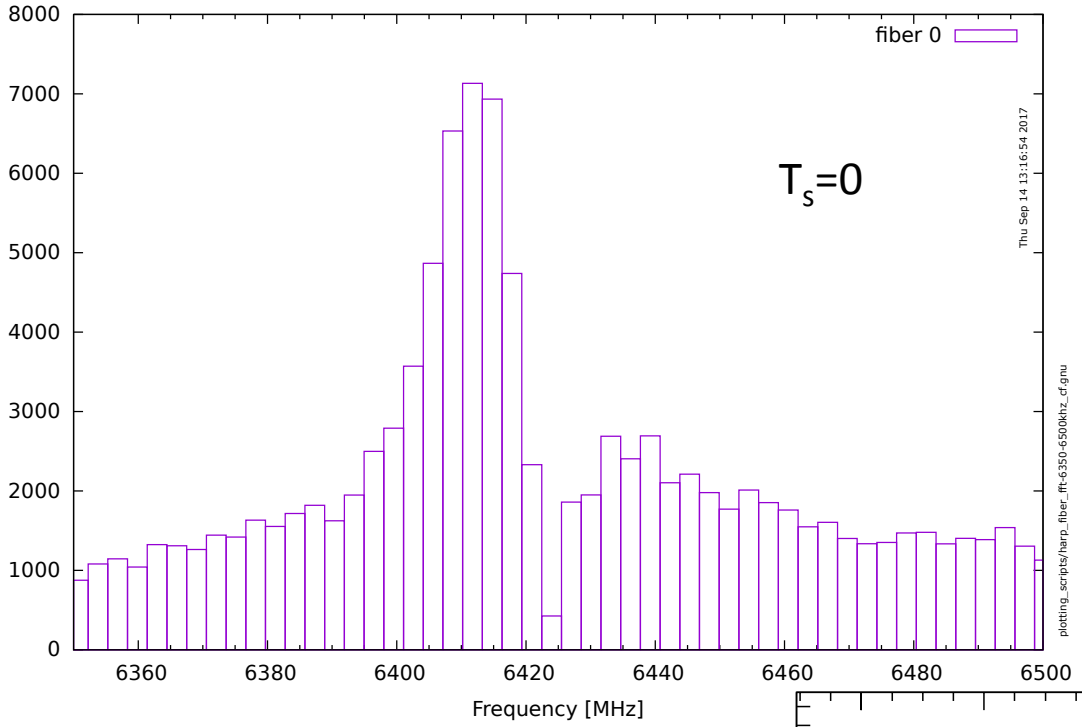




Individual fibers

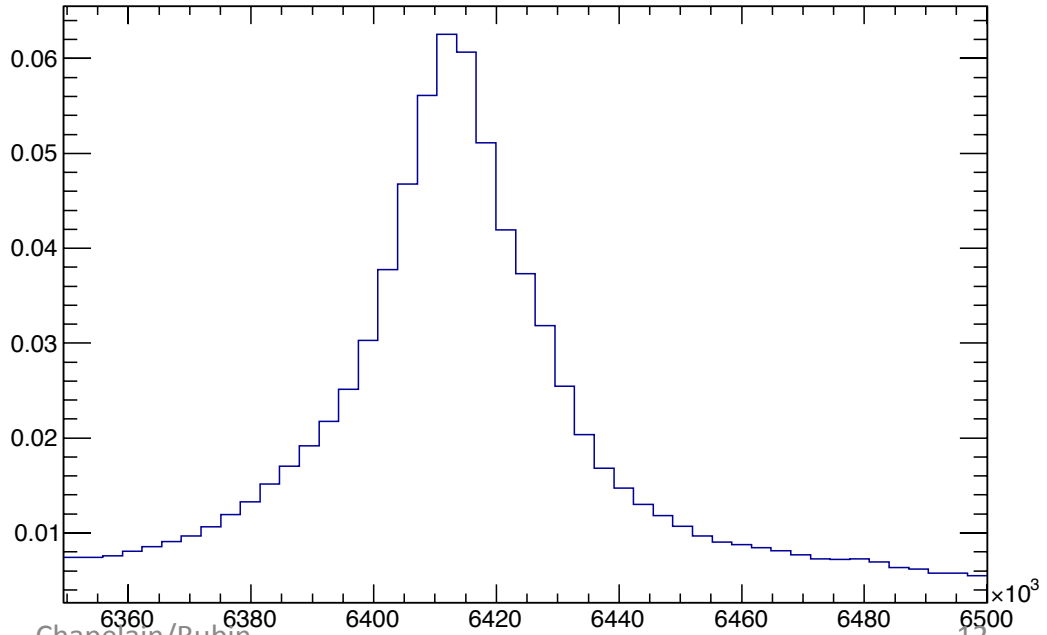
0-50 us



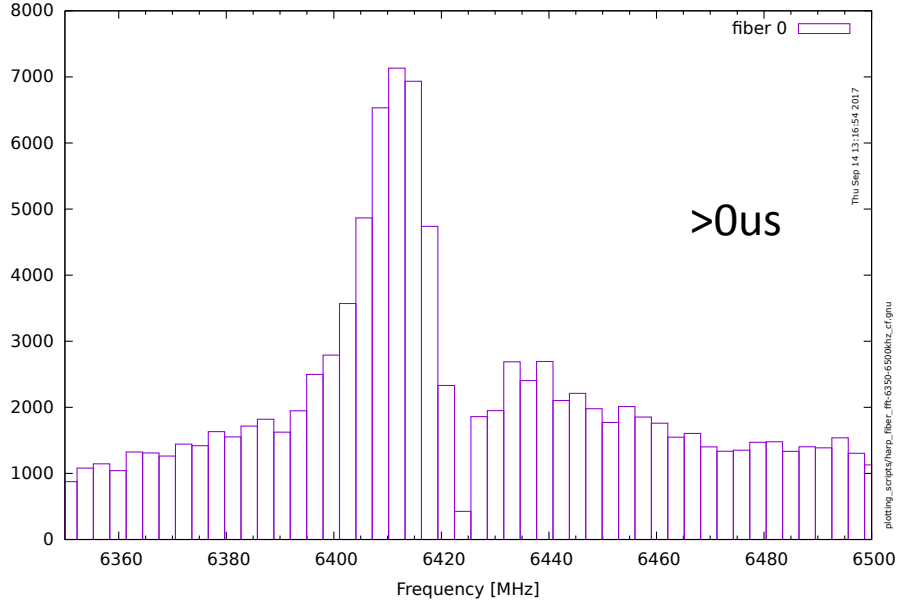


Fast rotation

Harp4Fiber4_0_fft

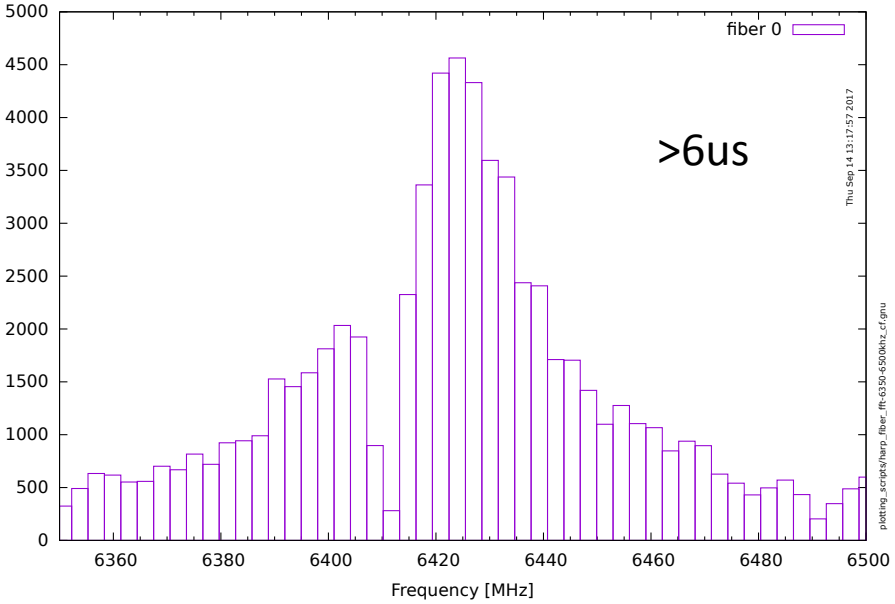


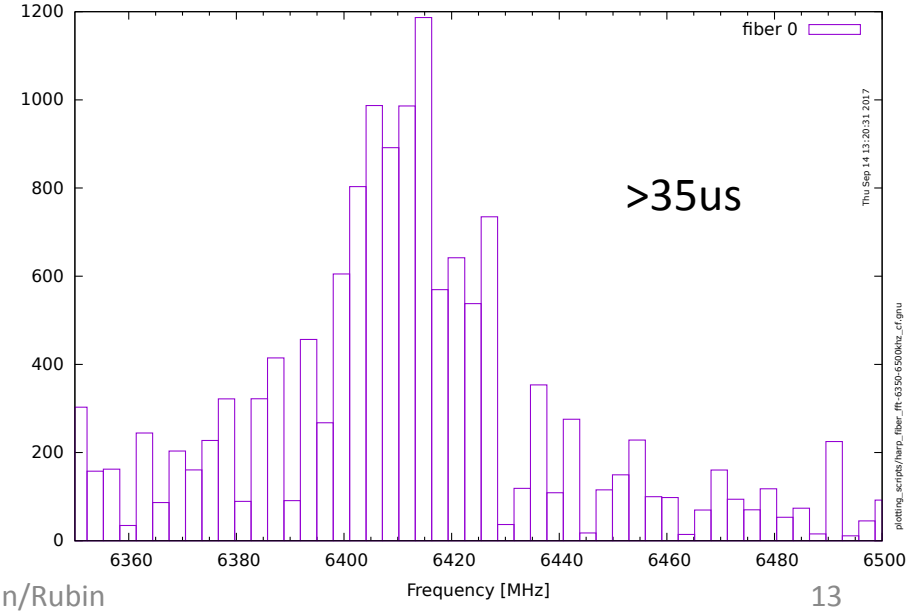
Peaks line up
Dip in simulation at 6425?



All plots are harp 4
(fiber 0 = center)

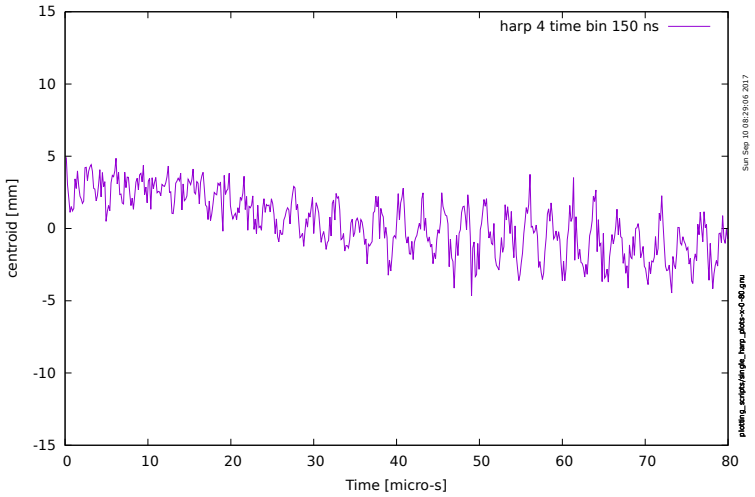
Peak shifts right > 6us
and left again > 35us?





Simulation with nominal 290 G kick

centroid



width

