

fast clock and charge asymmetry check

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5/3 2013

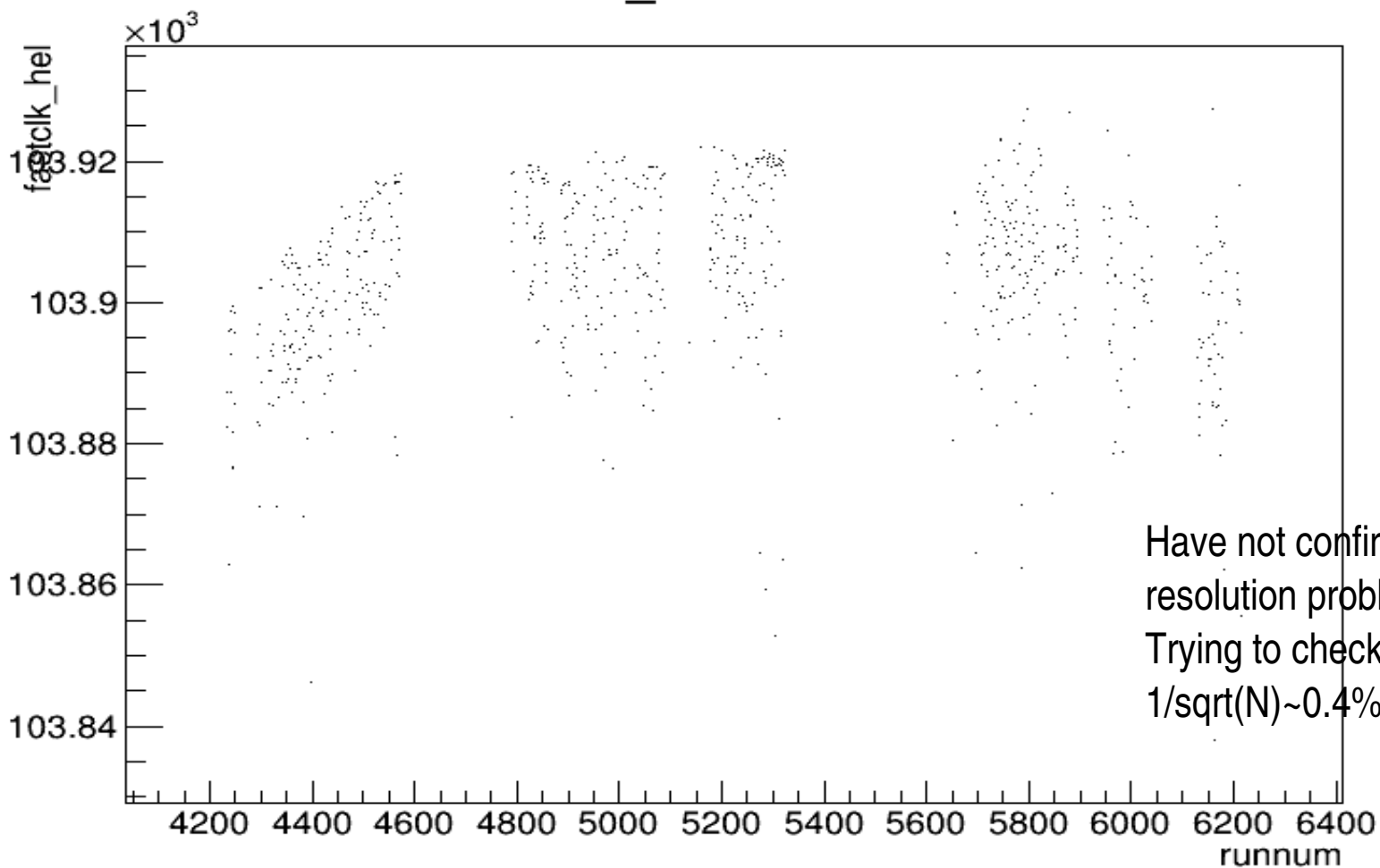
- fast clock rate check status
- charge asymmetry check status

Fast clock rate calculated by helicity (recorded in sis3801 scale
 (all left arm good runs (production runs)))

Method:

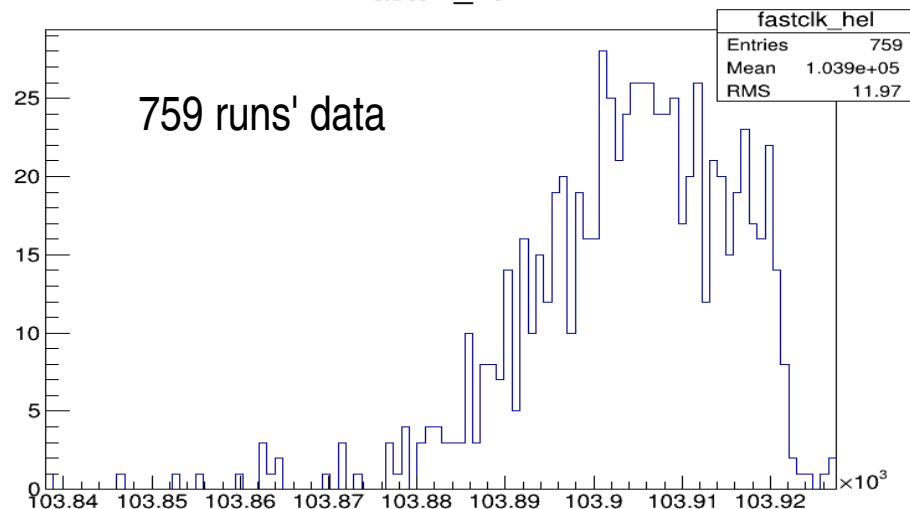
Each helicity triggered ringbuffer have fastclock info
 Just average them and divide the helicity stable period in

fastclk_hel vs runnum

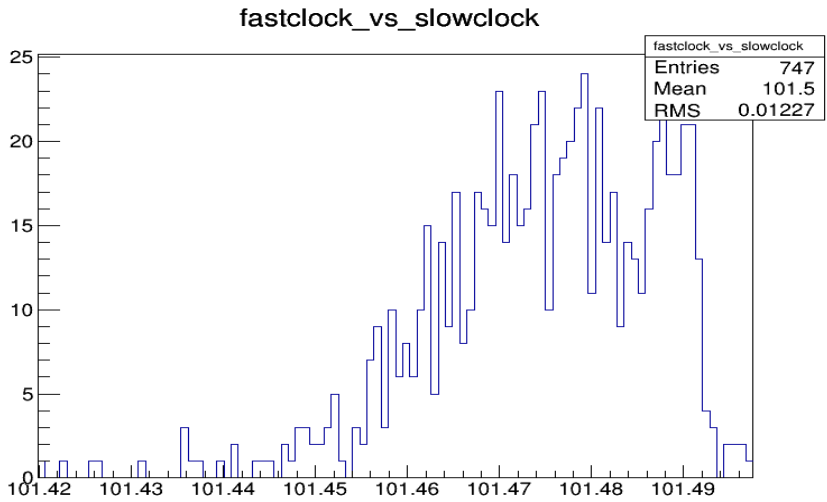


Have not confirmed if it is the measurement
 resolution problem or fastclock shift itself
 Trying to check it now
 $1/\sqrt{N} \sim 0.4\% \sim 41$ since $N \sim 7 \times 10^6$ events

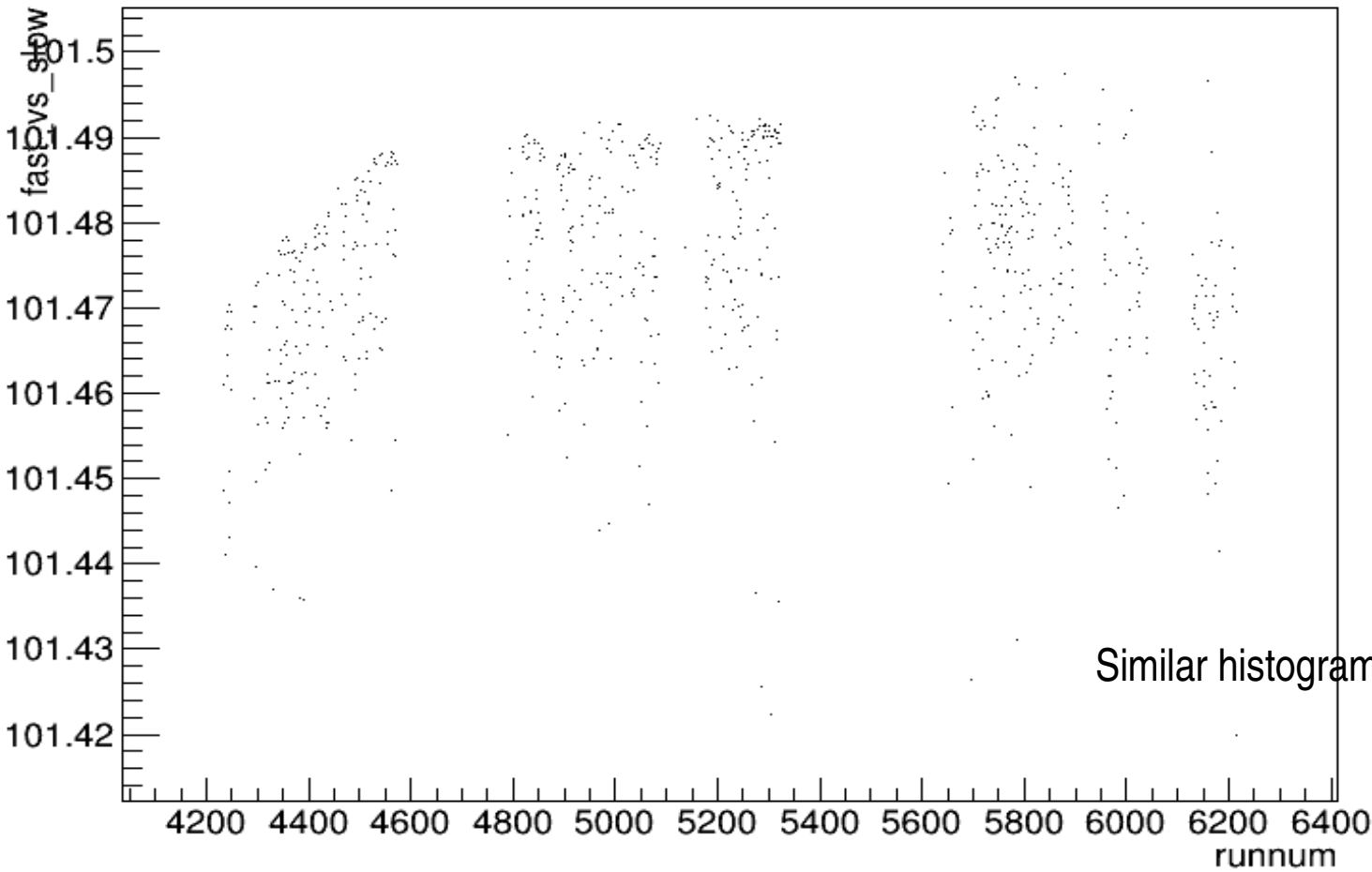
fastclk_hel



Compare with the ratio between fast clock and slow clock recorded in sis3800



fast_vs_slow vs runnum



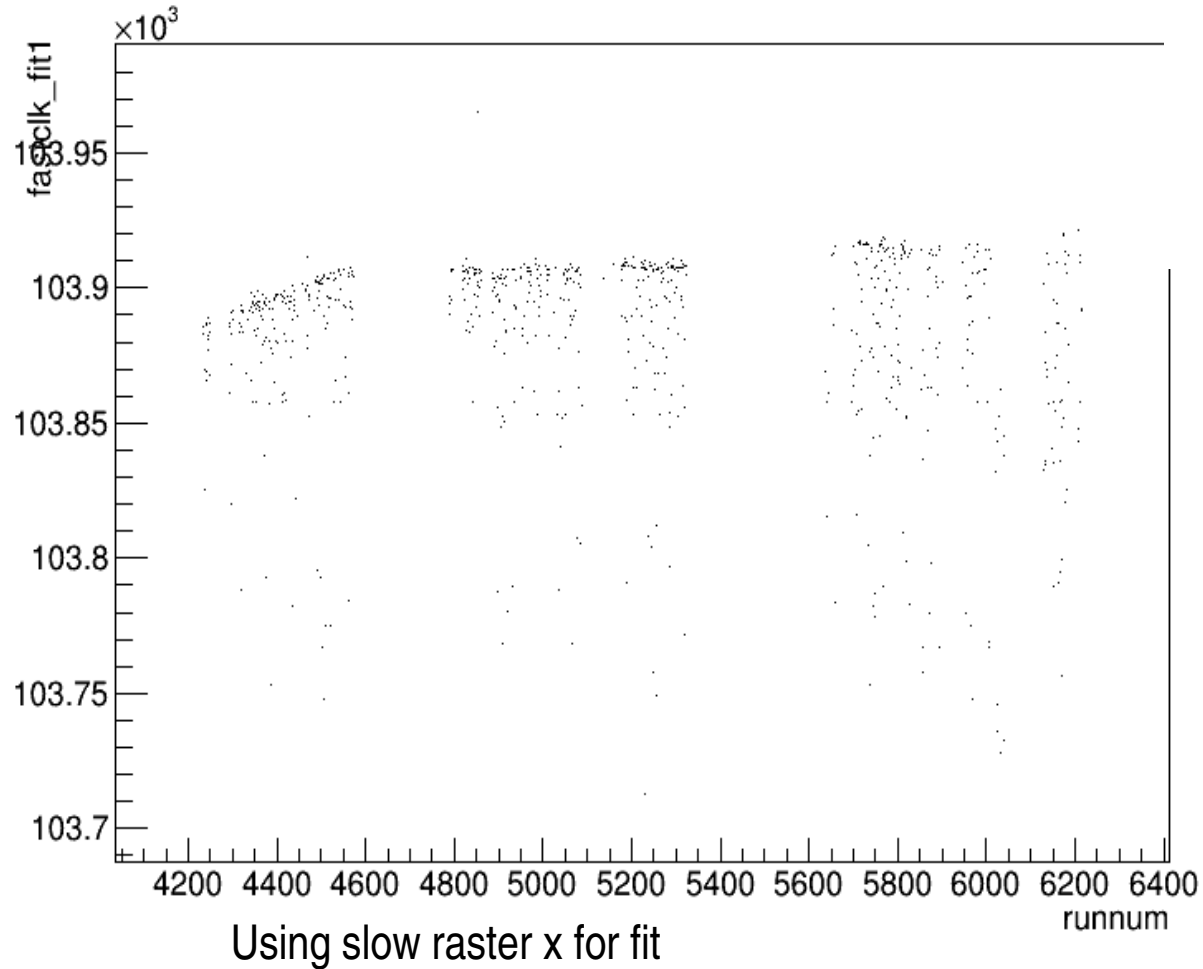
Compare with the fast clock recorded in fastbus

run	fast clock recorded in sis3800 vs in roc 3	fast clock recorded in sis3800 vs in roc 4	fast clock recorded in sis3800 vs in roc 5
4295	1	1	1
4296	1	1	1
4297	1	1	1
4298	1	1	1
4299	1	1	1
4300	1	1	1
4316	1	1	1
4317	1	1	1
4318	1	1	1
4319	1	1	1
...
6183	1	1	1
6184	1	1	1
6185	1	1	1
6207	1	1	1
6208	1	1	1
6209	1	1	1
6210	1	1	1
6211	1	1	1
6212	1	1	1
6213	1	1	1
6214	1	1	1

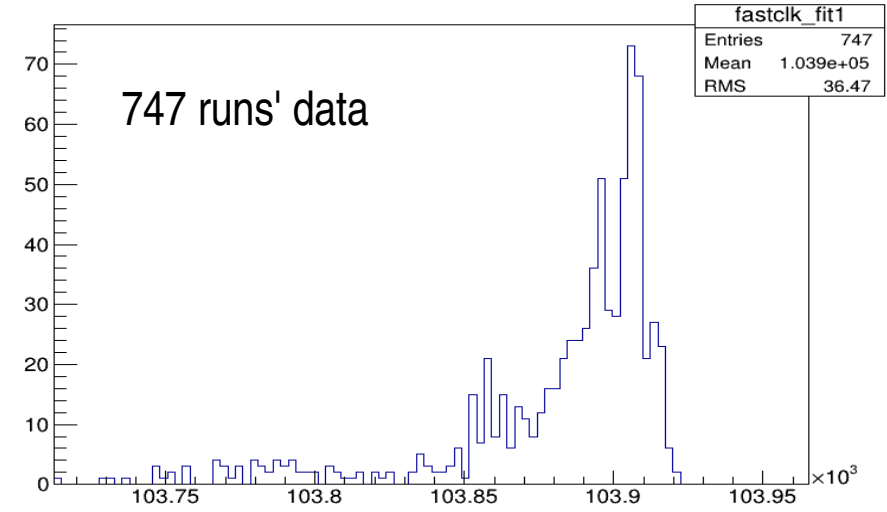
All matched
(forall left arm good runs(production runs))

Compare with the fast clock rate calculated by using slow raster fit

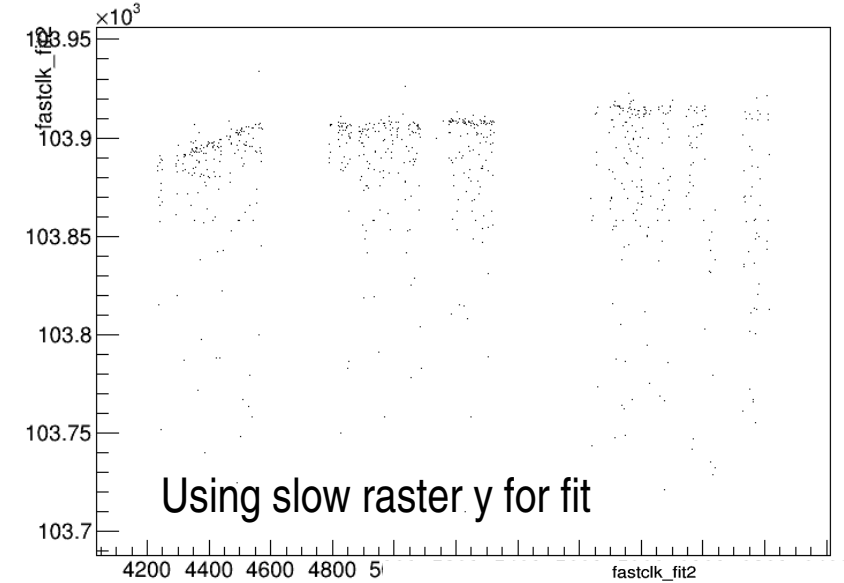
fastclk_fit1 vs runnum



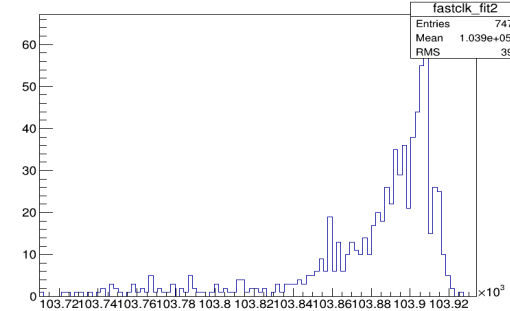
fastclk_fit1



fastclk_fit2 vs runnum

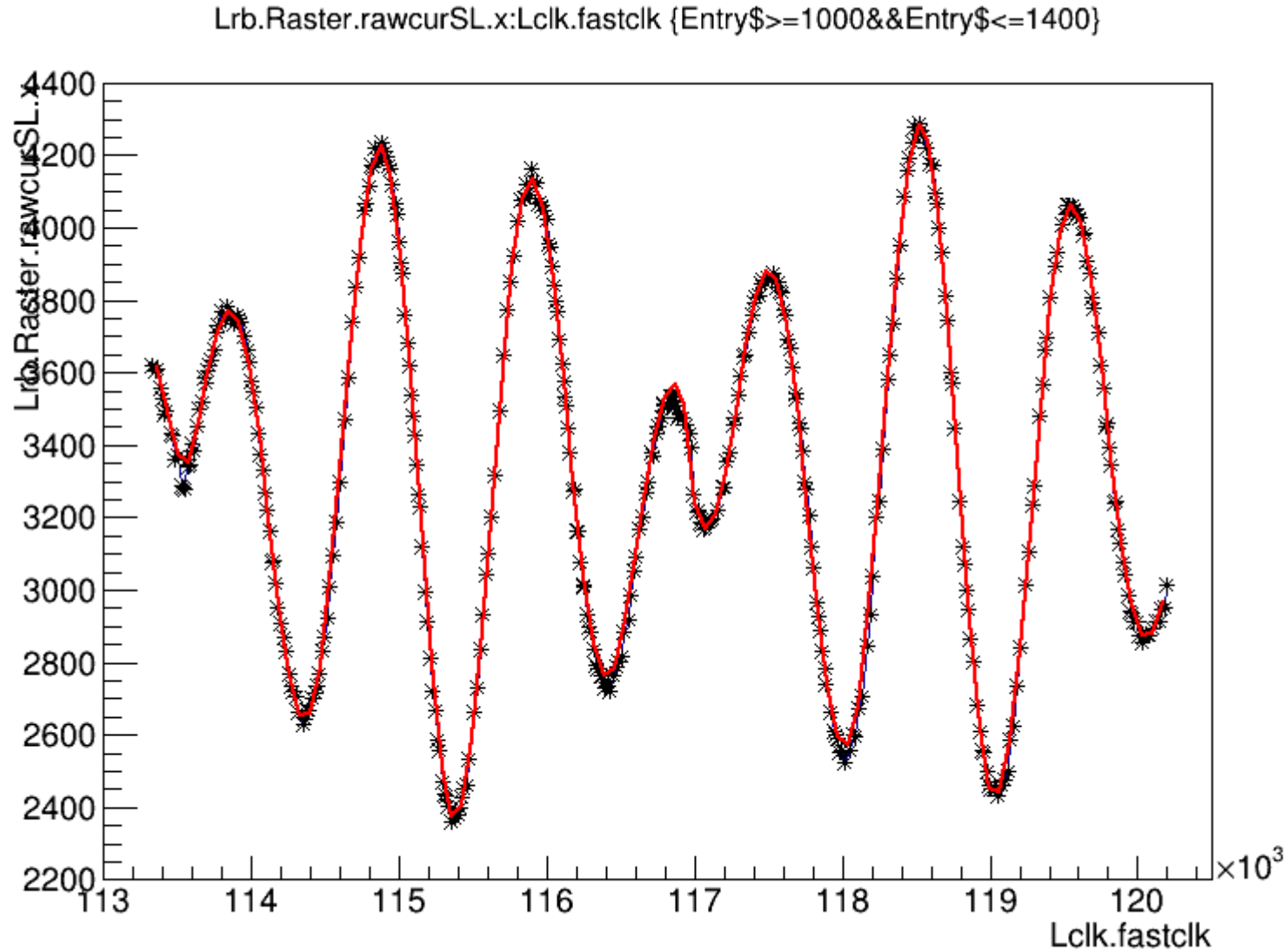


fastclk_fit2

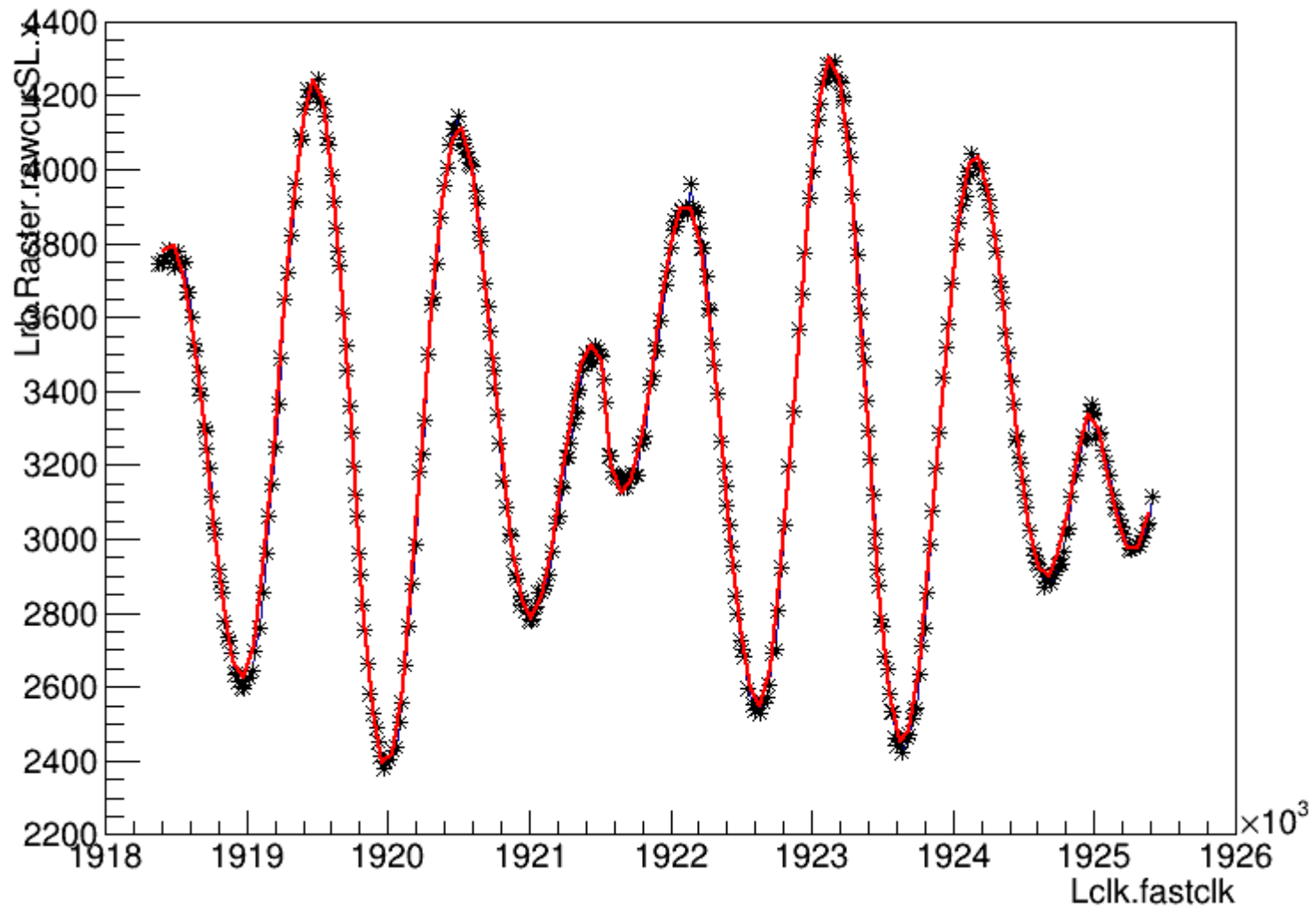


This is the raw slow raster ADC data(black star) compared with the fit result(red line)

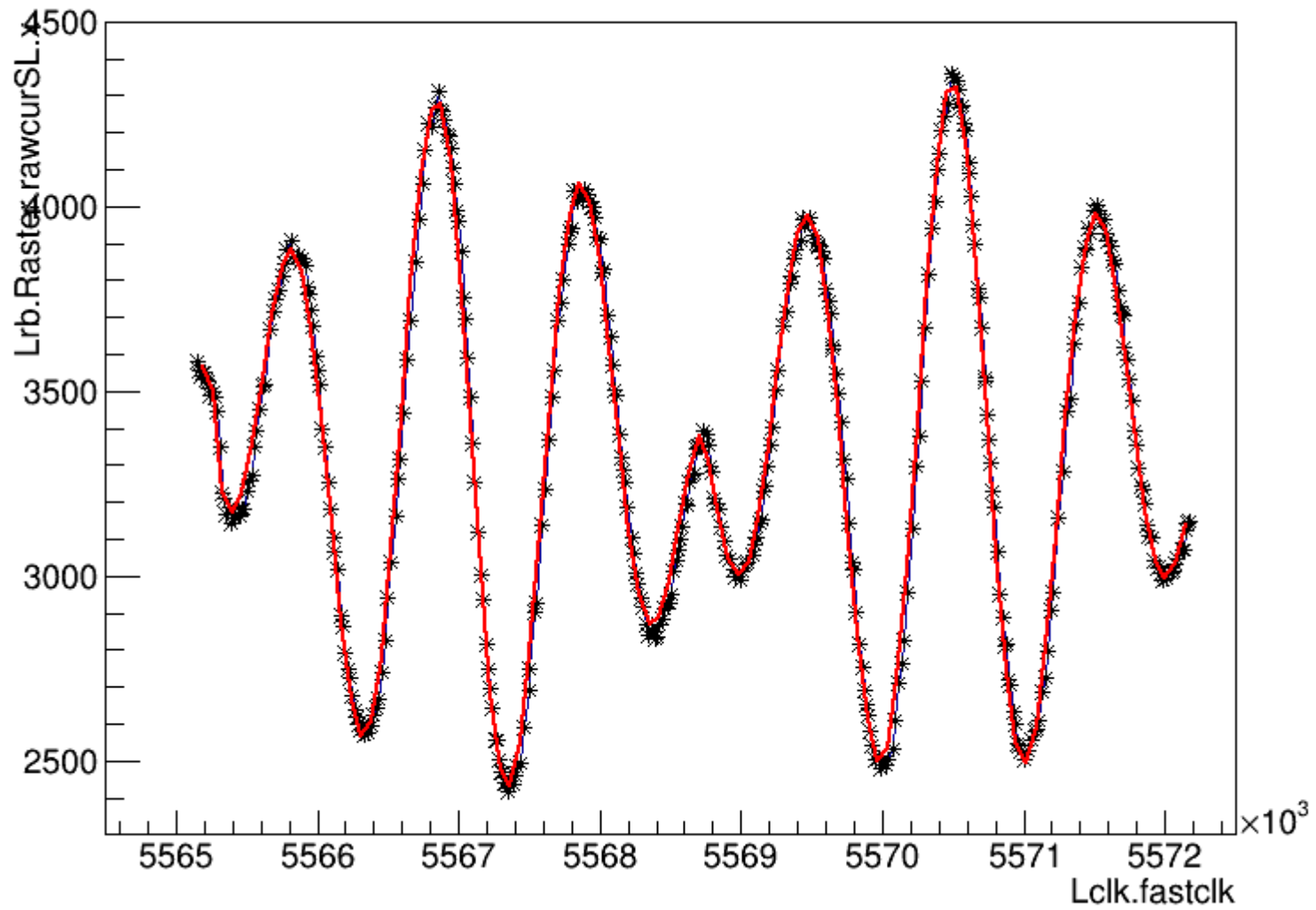
The following pages of pictures are in a same run with same initial phase, AM phase, fast clock rate, just show in different range of entries



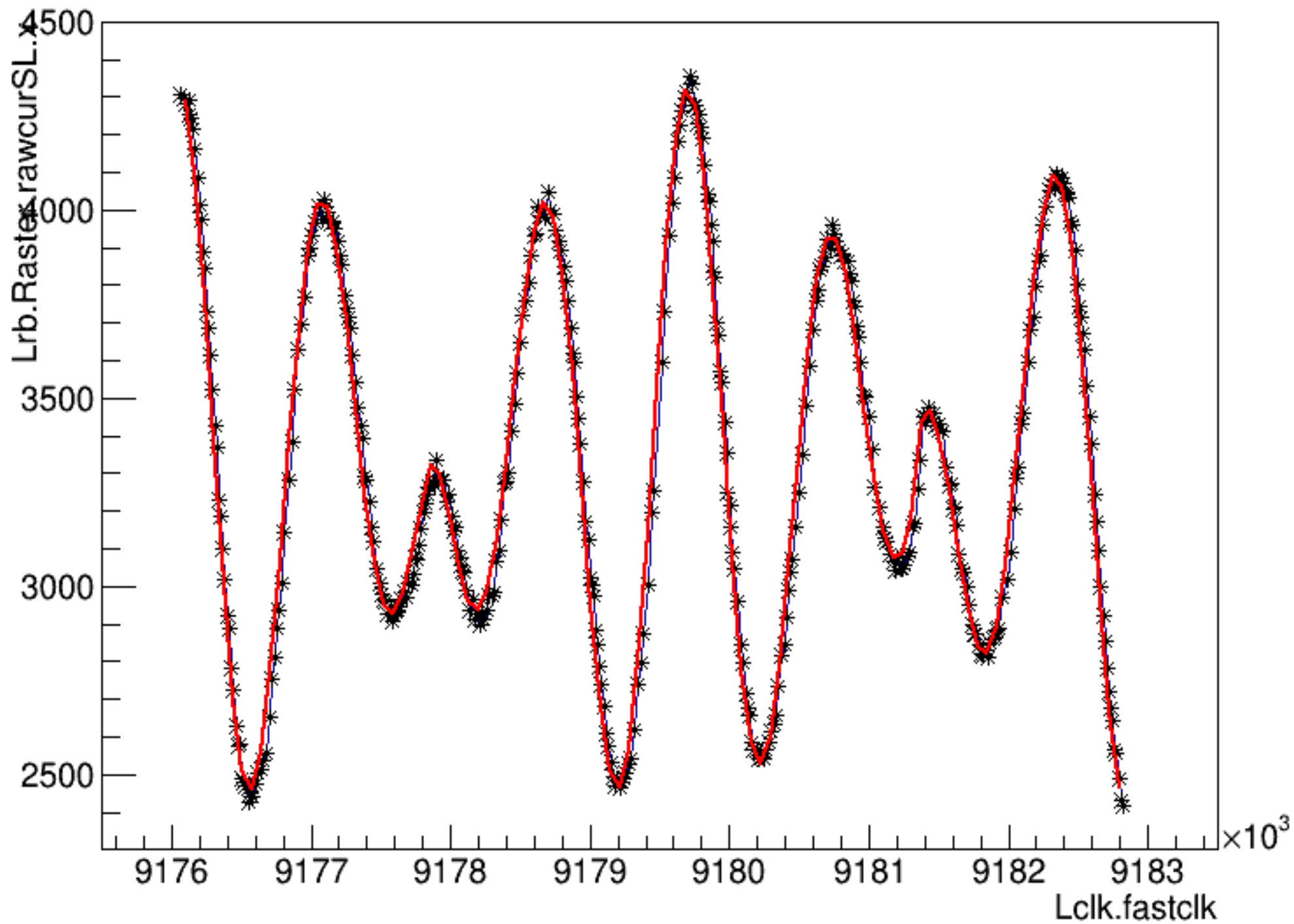
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=100000&&Entry\$<=100400}



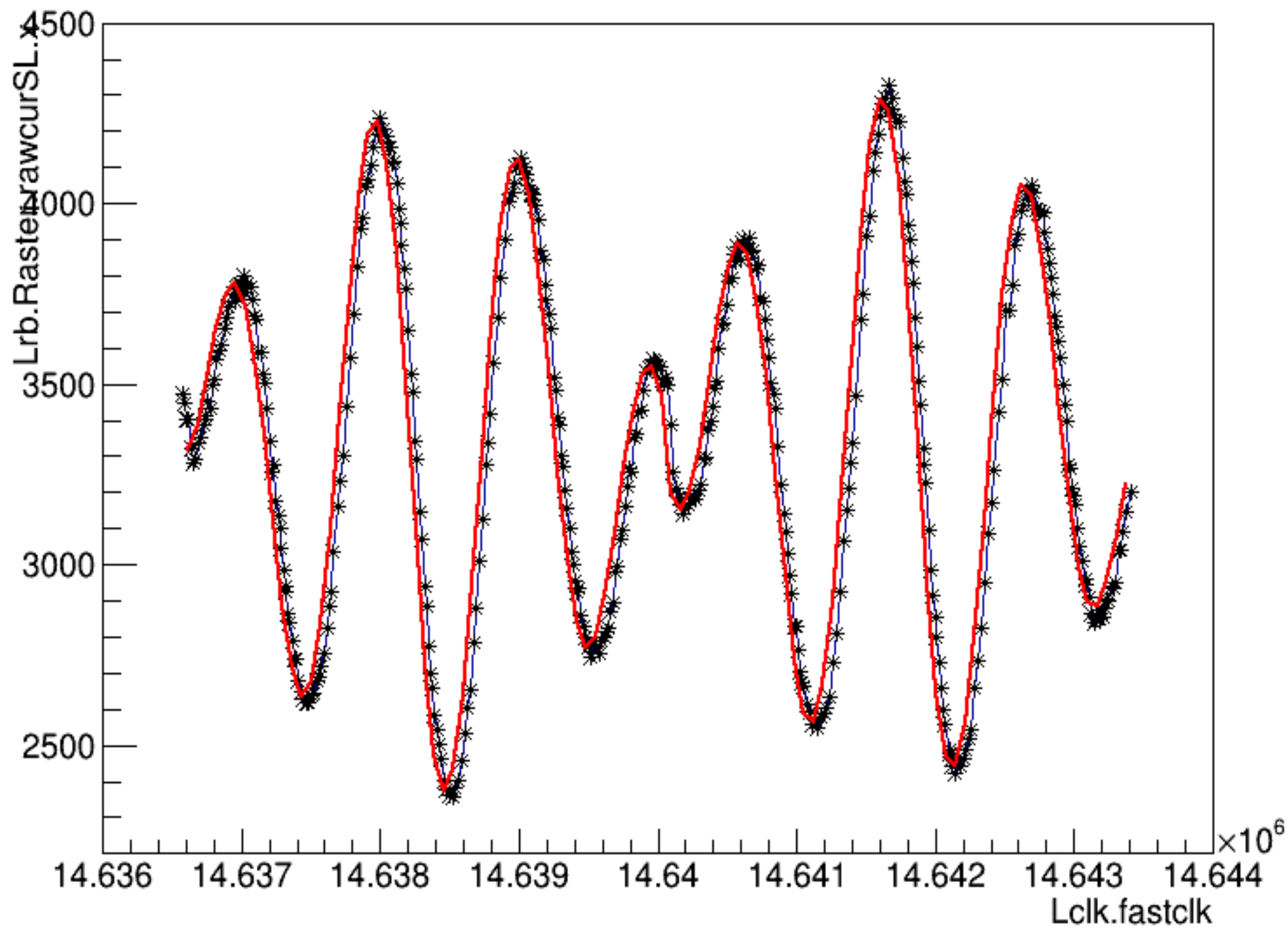
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=301000&&Entry\$<=301400}



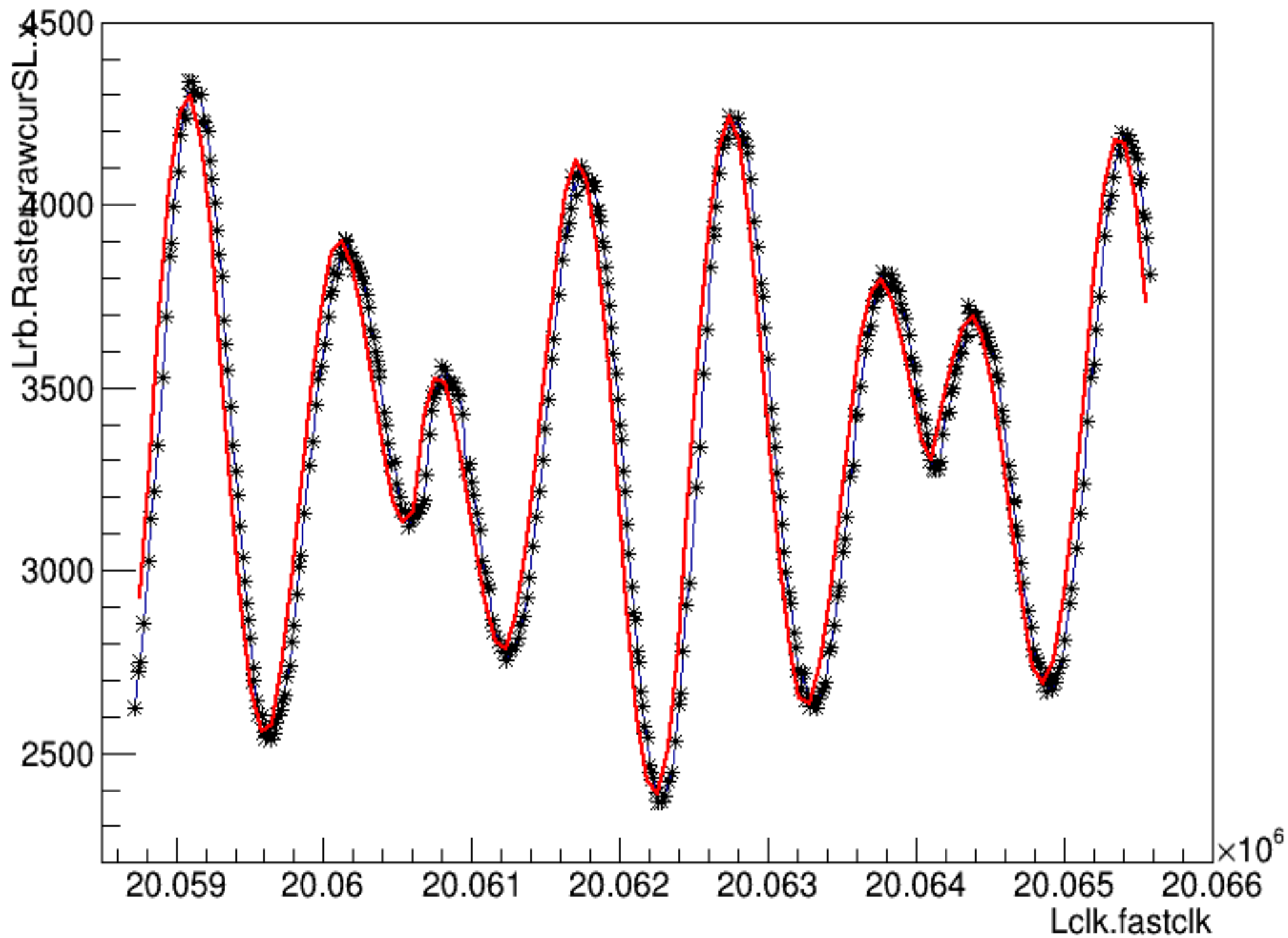
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=501000&&Entry\$<=501400}



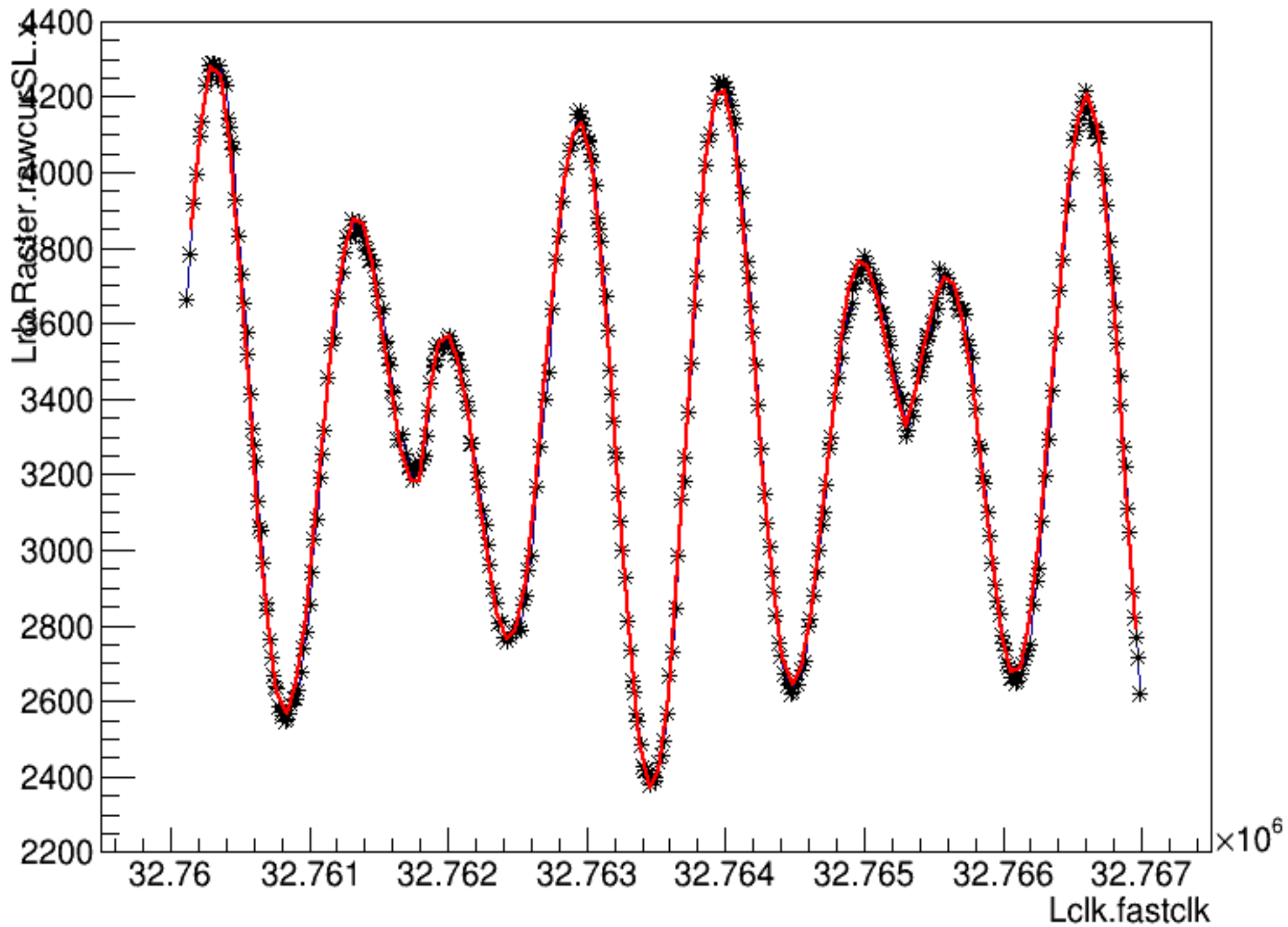
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=801000&&Entry\$<=801400}



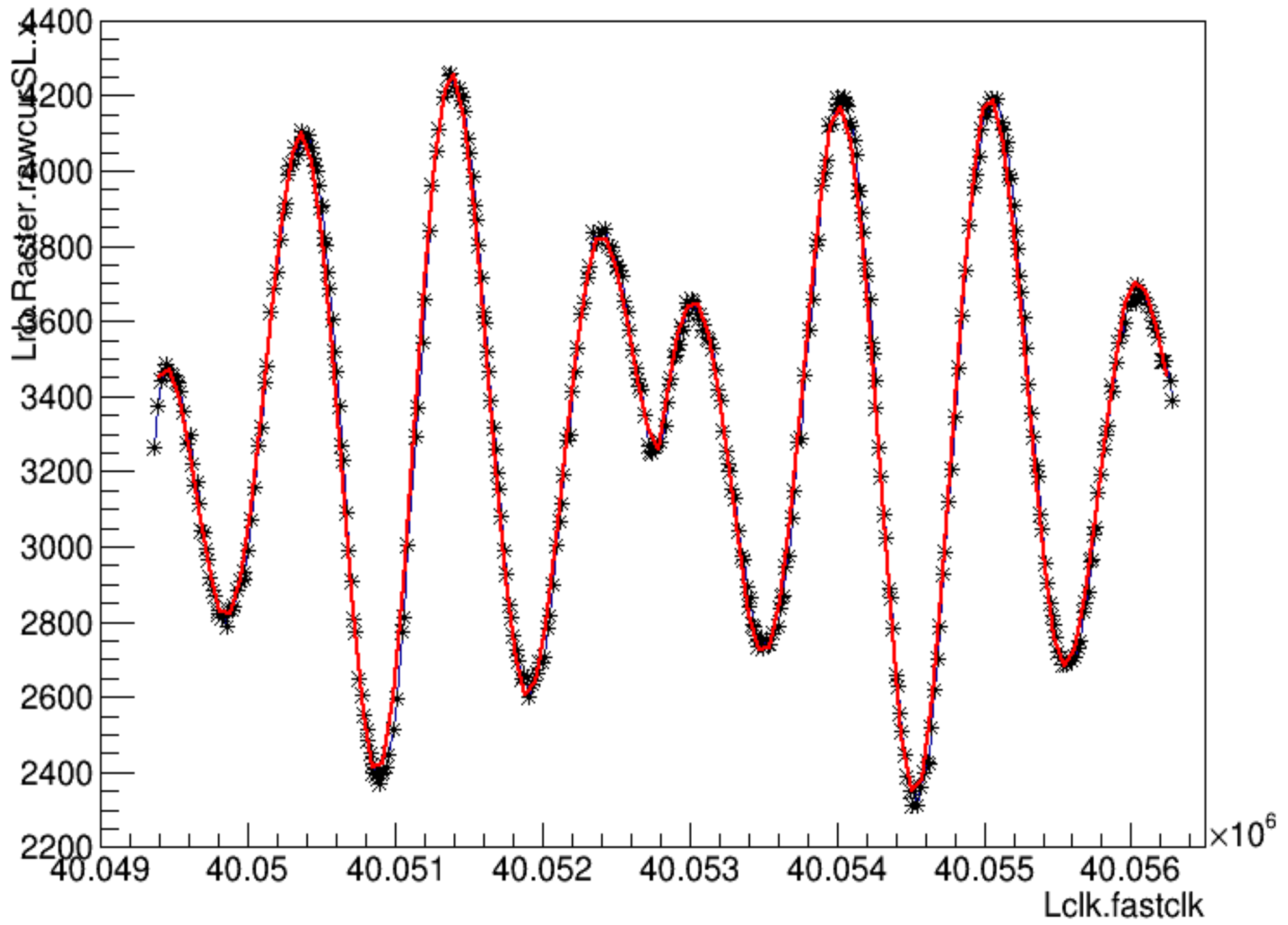
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=1101000&&Entry\$<=1101400}



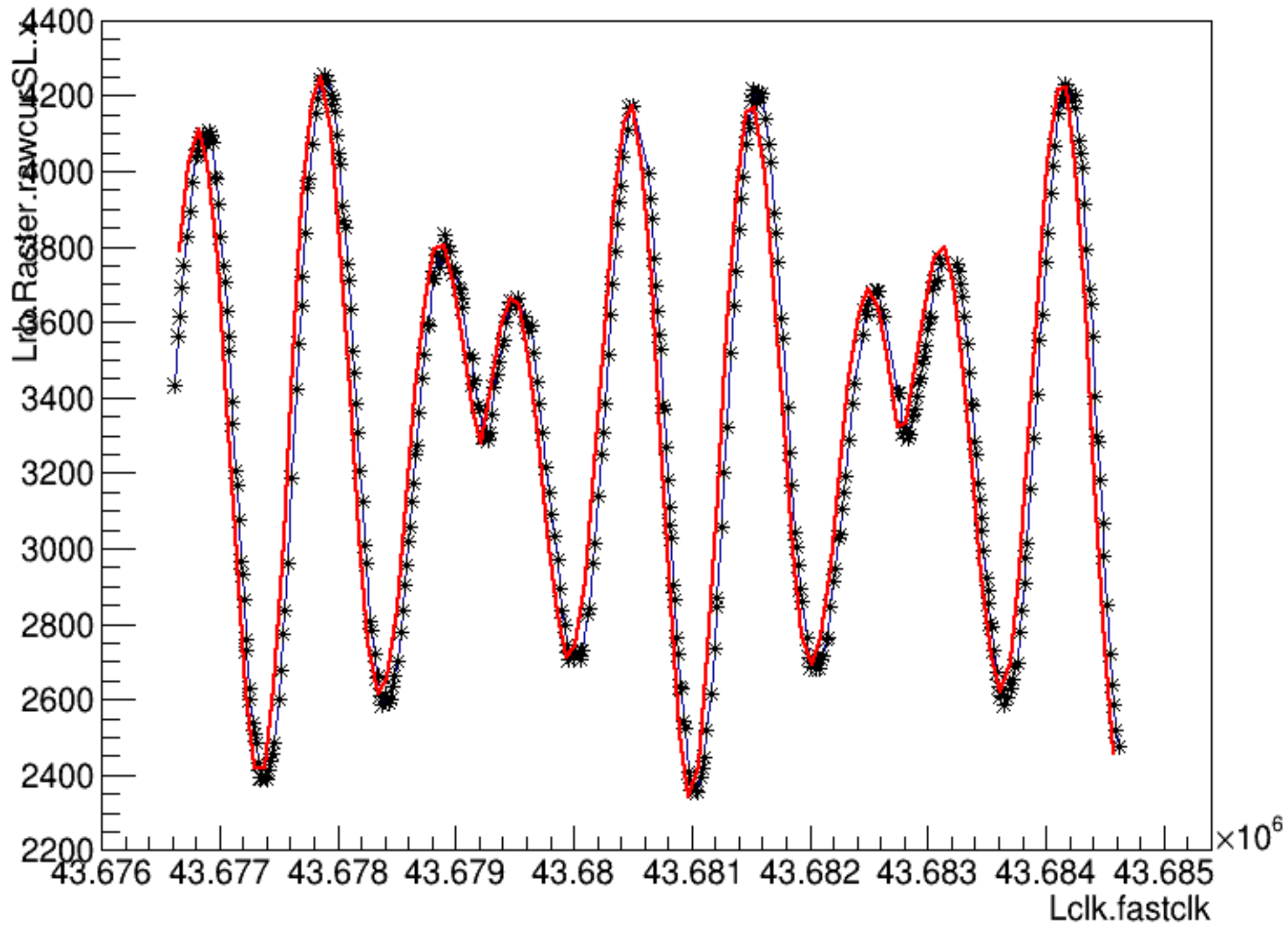
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=1801000&&Entry\$<=1801400}



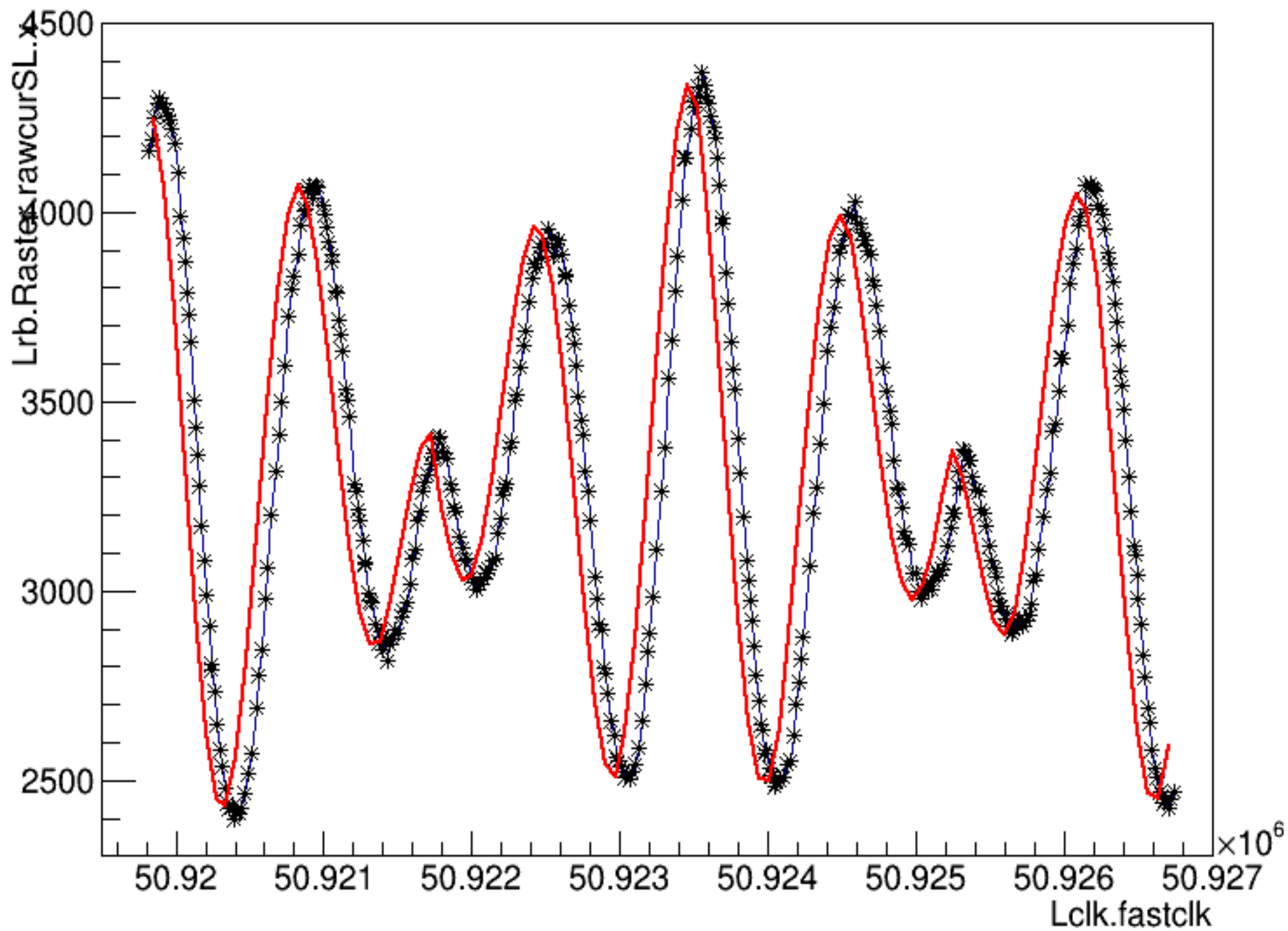
Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=2201000&&Entry\$<=2201400}



Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=2401000&&Entry\$<=2401400}



Lrb.Raster.rawcurSL.x:Lclk.fastclk {Entry\$>=2801000&&Entry\$<=2801400}

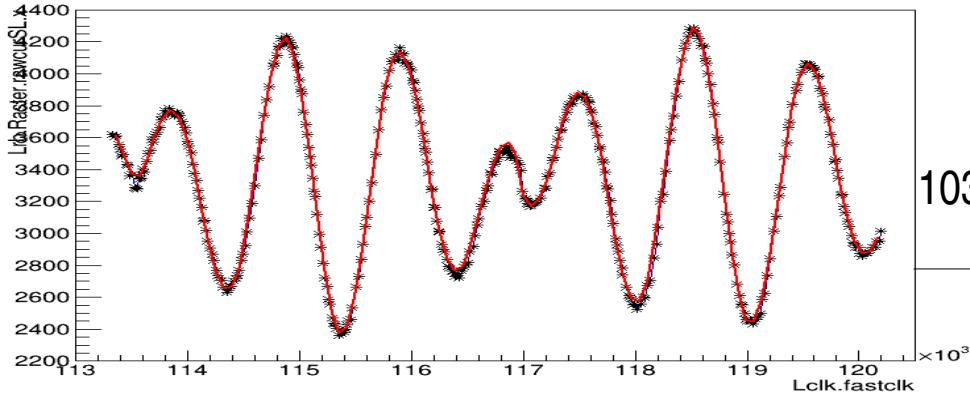


1Hz different of fast clock rate cause the different of the fit result compare with the raw data

Total events in a normal production run:700000

Entry range 1000~1400

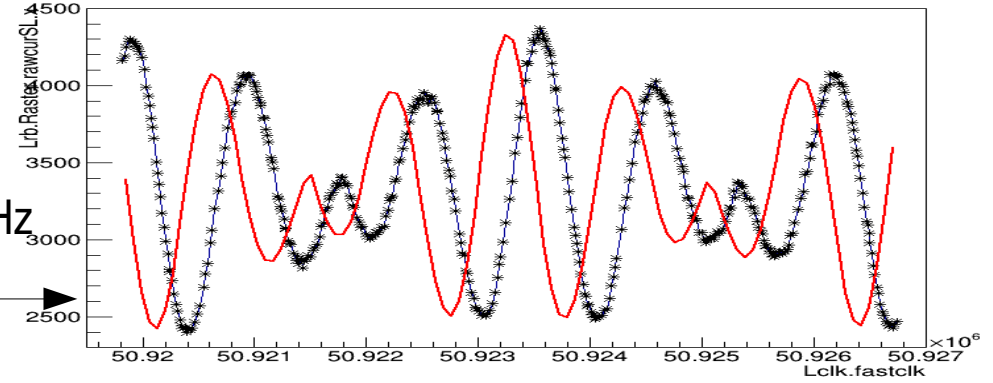
Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=1000&&Entry\$<=1400)



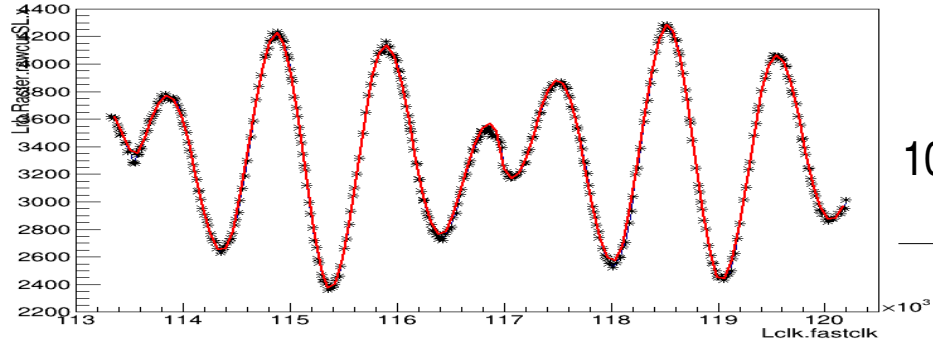
103909Hz

Entry range 280100~280400

Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=280100&&Entry\$<=280400)

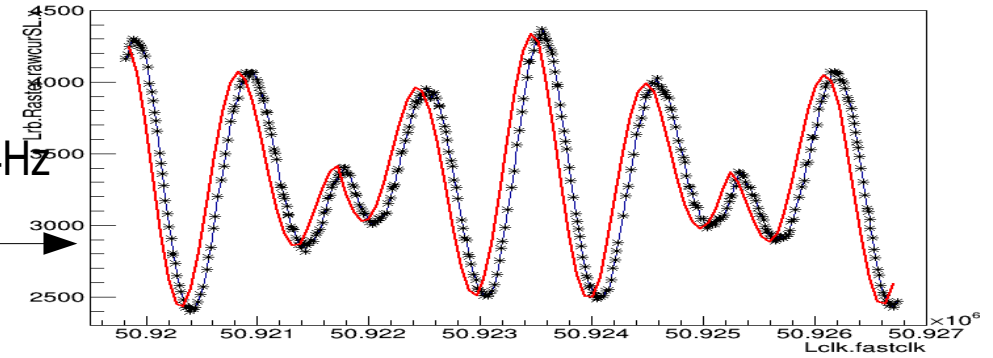


Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=1000&&Entry\$<=1400)

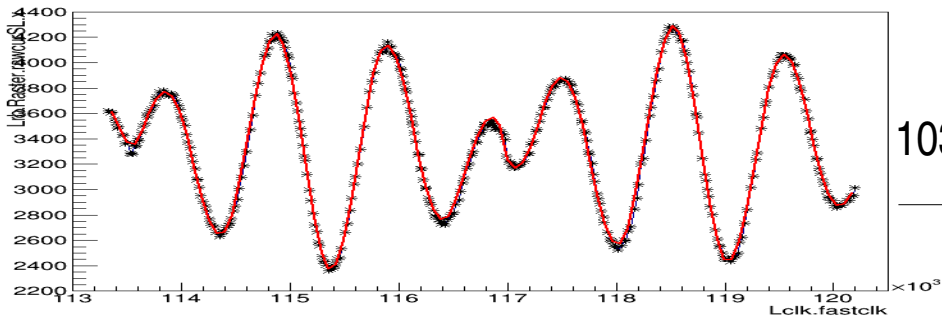


103909.4Hz

Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=280100&&Entry\$<=280400)

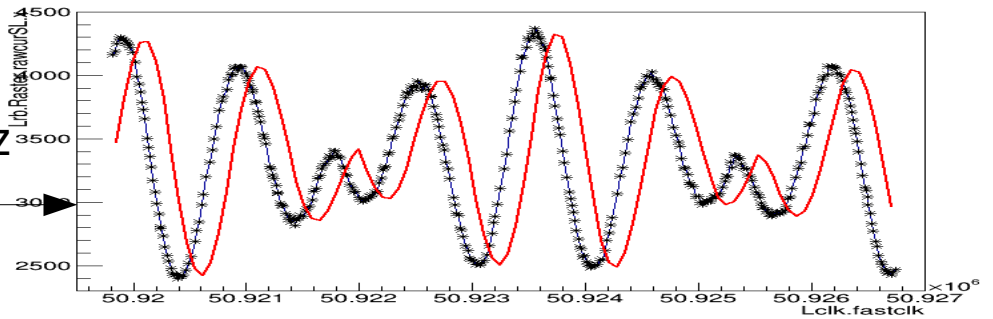


Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=1000&&Entry\$<=1400)



103910Hz

Lrb.Raster.rawcurSL.x:Lclk.fastclk (Entry\$>=280100&&Entry\$<=280400)



Fit program works not perfect and need to improve:

1. when fast clock value not start at 0 at the beginning of run
2. when there has beam trip during run
3. now the fit result is not very matched at the end of run(now can fit 100000 events range,will improve later)

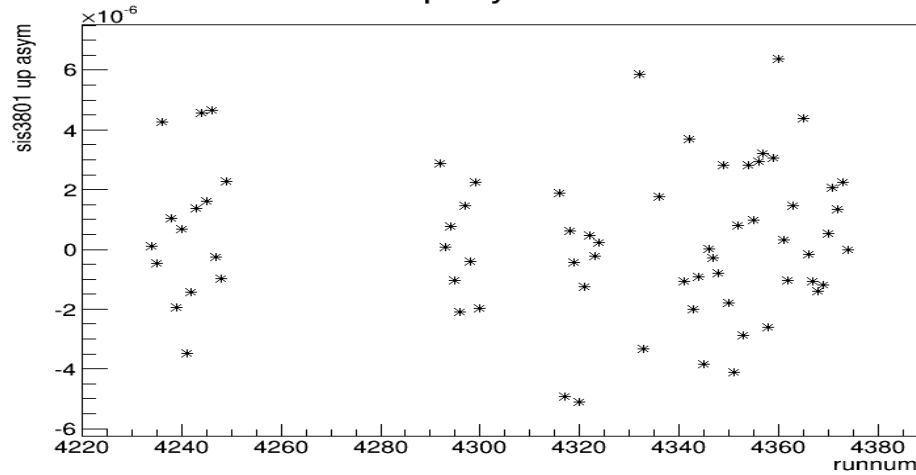
Will finish it later

Charge asymmetry status

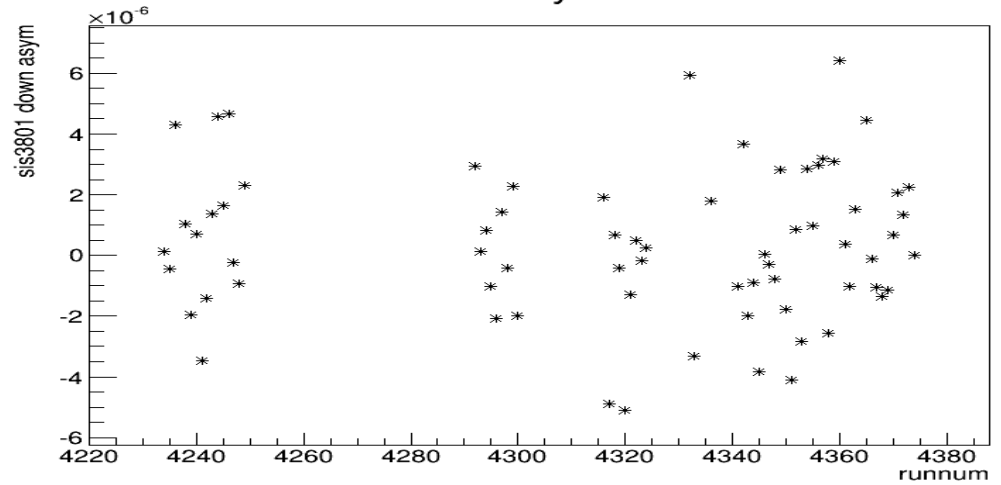
1. using Chao's helicity decoder

Running in computer now, will finish soon(waiting for result)

sis3801 up asym vs runnum

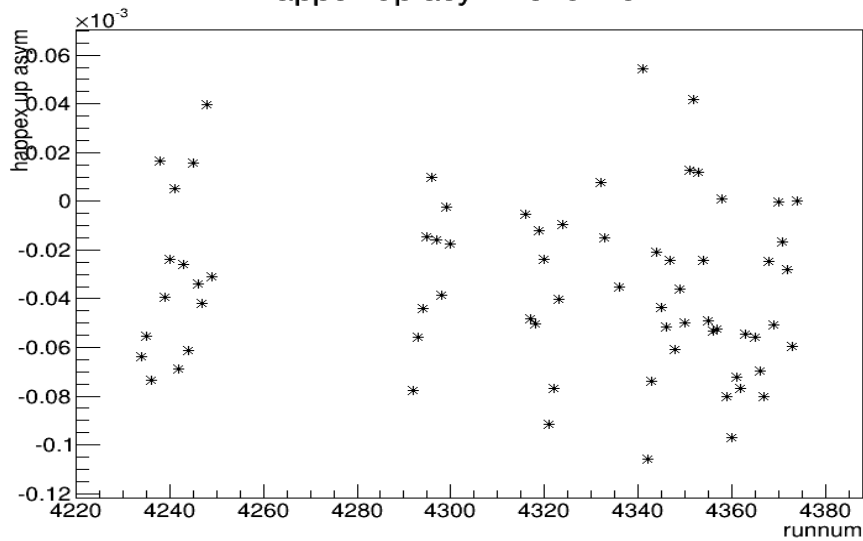


sis3801 down asym vs runnum

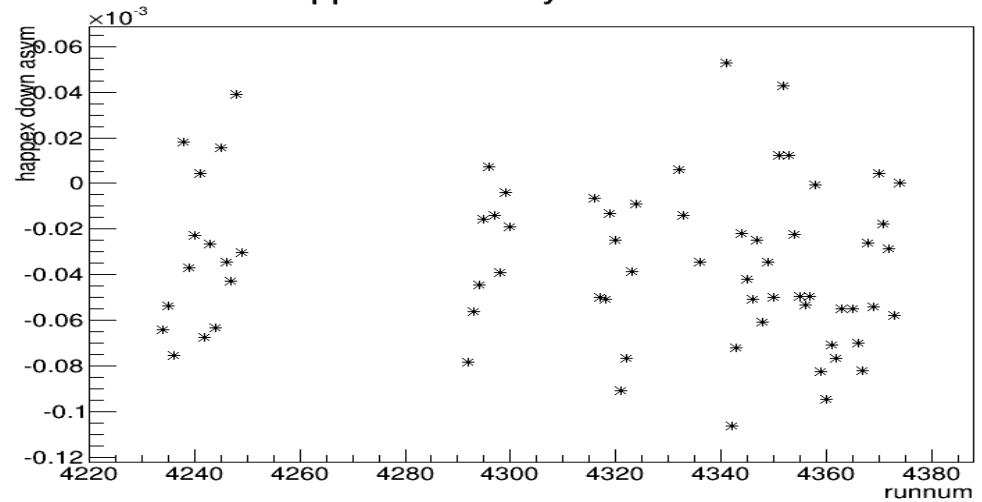


Initial result for a few runs by using calibrated bcm info, need to wait more results

happex up asym vs runnum



happex down asym vs runnum

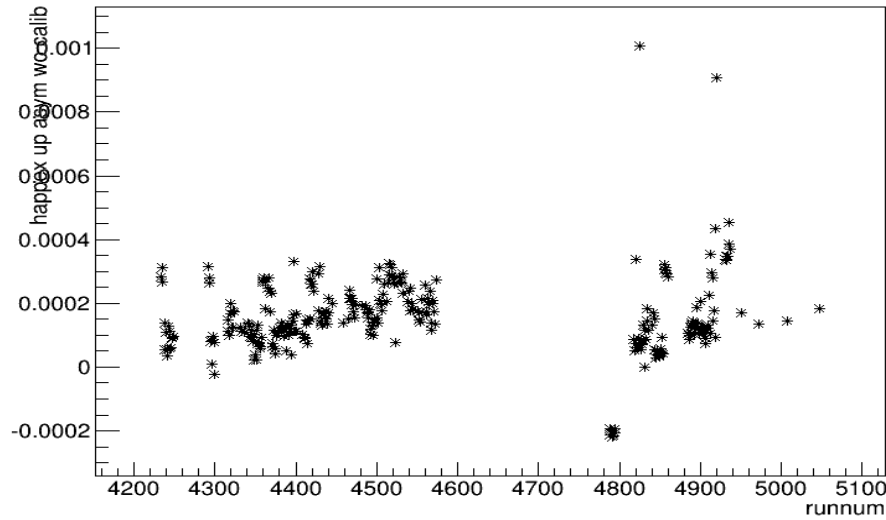


Charge asymmetry status

1. using my own's decoder or double check(happex and sis3801)

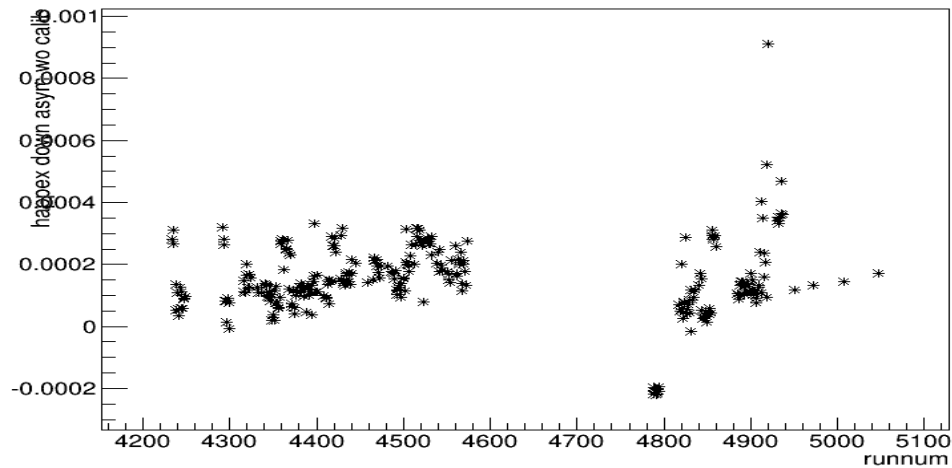
Debugging now,almost finished

happex up asym wo calib vs runnum



Ini result by using happex
With uncalibrated bcm info

happex down asym wo calib vs runnum



Charge asymmetry(good production run)

- Hopefully will finished before next meeting
- Will post at next meeting and elog

bpm noice study

- Just copied data from jlab tape to china,will start now