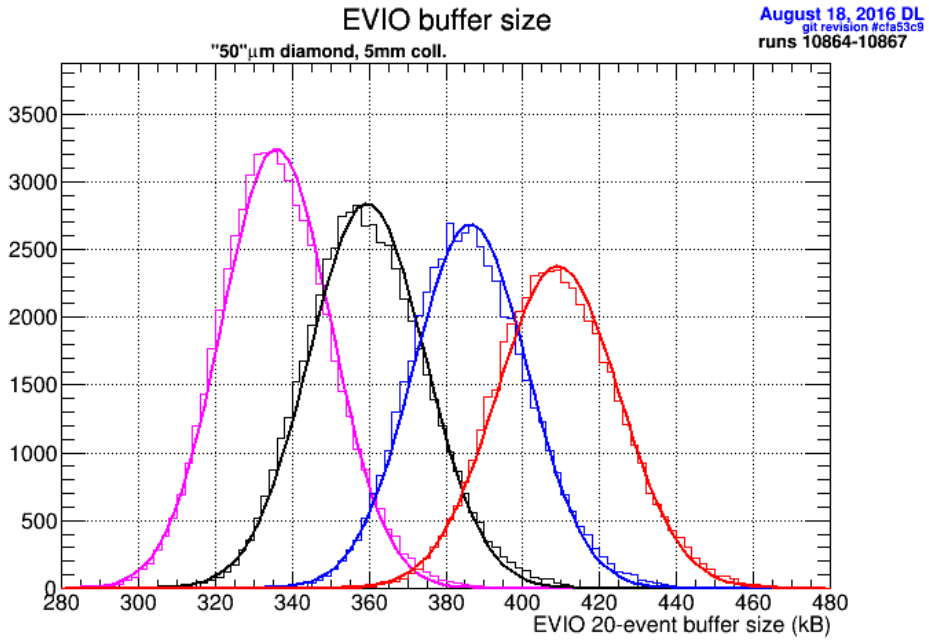
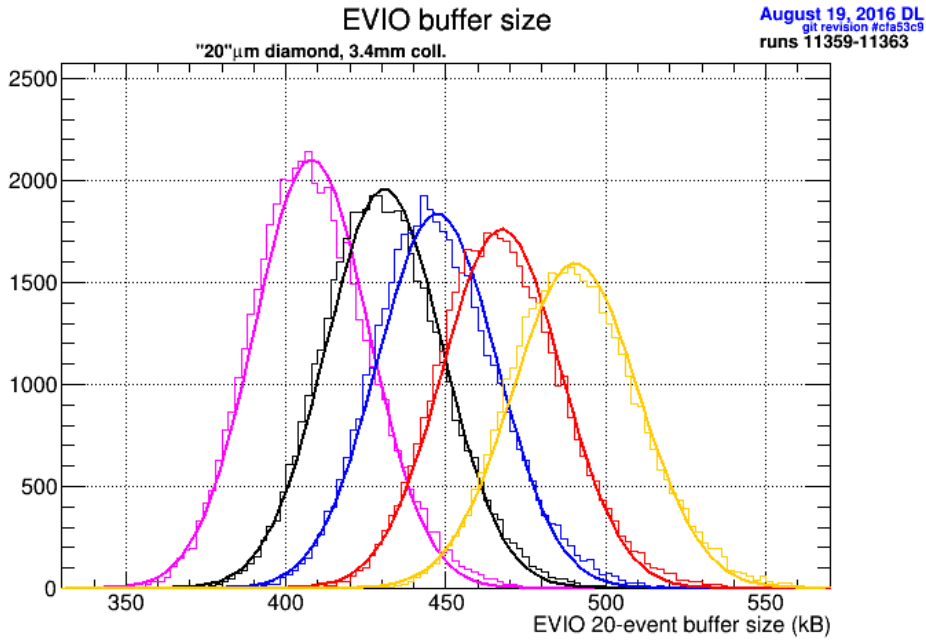
- *Plot on left for runs 10864-10867 has been shown previously*
- *Plot on right for runs 11359-11363 is new*
  - *These overlap a lot in beam intensity as shown on next slide*

50μm, 5mm collimator

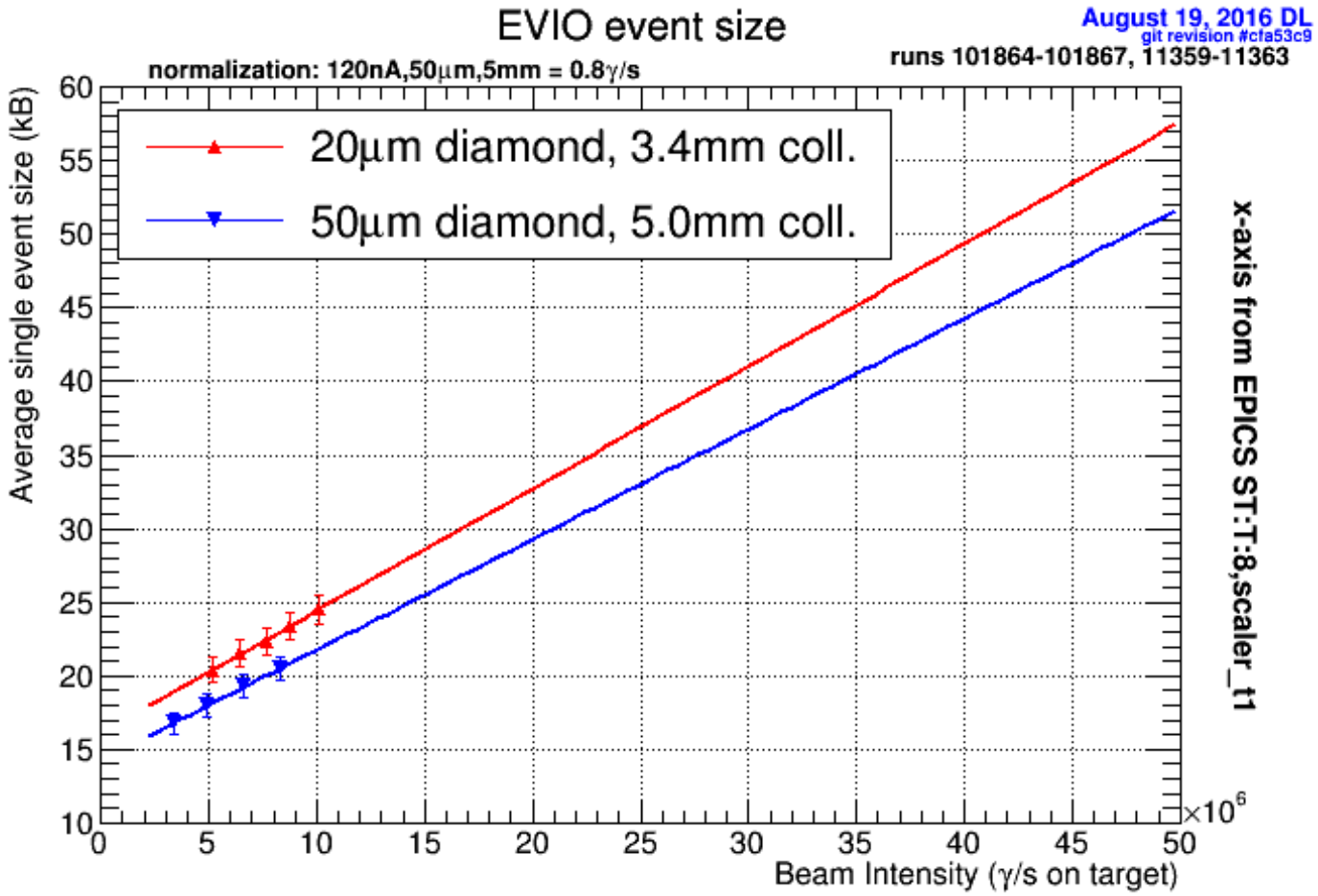


20μm, 3.4mm collimator



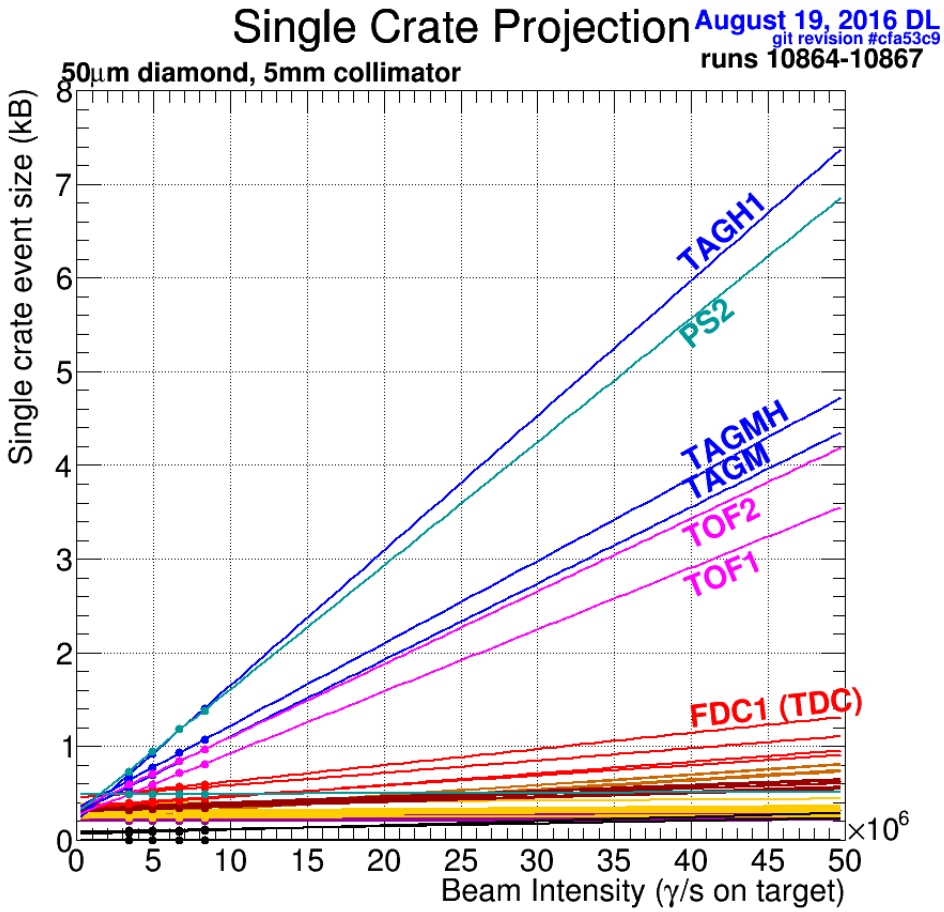
Extrapolating total event size (from fits on previous slide) to high luminosity

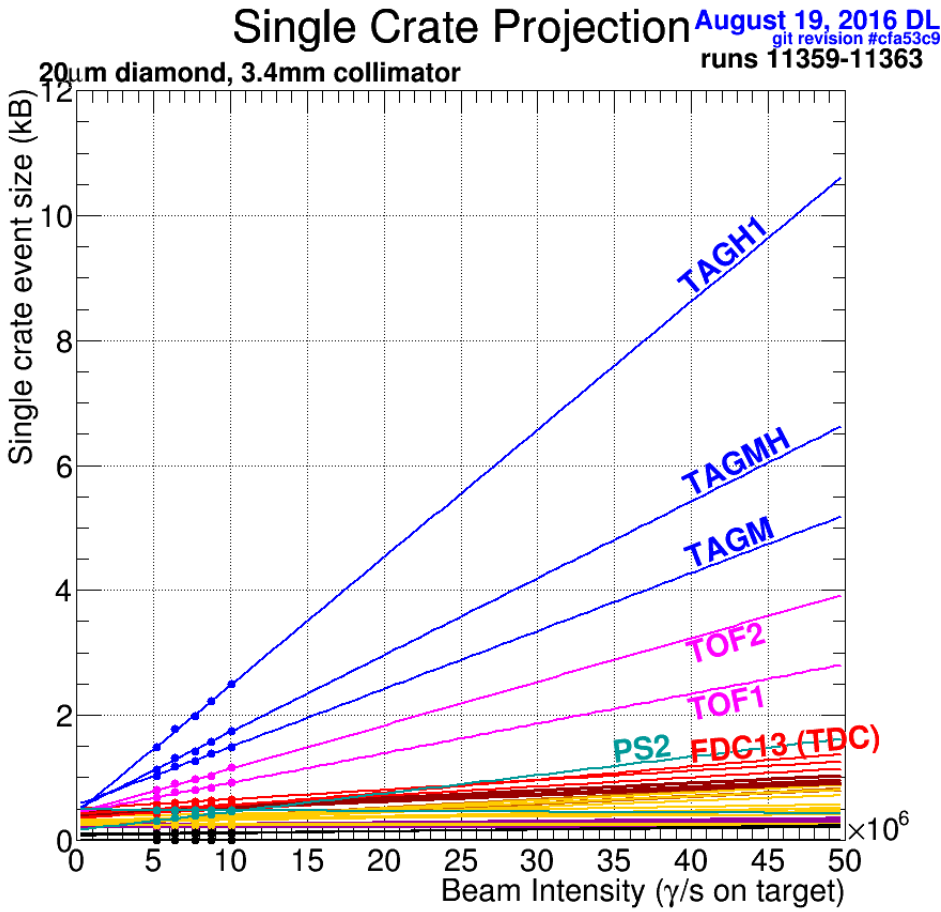
- For each run, a Start Counter scaler value from EPICS was used to calculate beam intensity.
- The normalization point was taken from run 10864 (125nA, 50μm, 5mm)
  - Assumed 120nA, 50μm, 5mm corresponds to 0.8×10^7 γ/s
- If we assume 100kHz L1 trigger rate at high intensity, then this would indicate 5-6 GB/s (*more details next slide*)



- These plots extrapolate the single crate, single event size to high luminosity
- Same technique described on previous slide for calculating beam intensity
- Assuming 100kHz L1 trigger for high intensity, 20μm data suggests ~150MB/s for FDC F1TDC crate

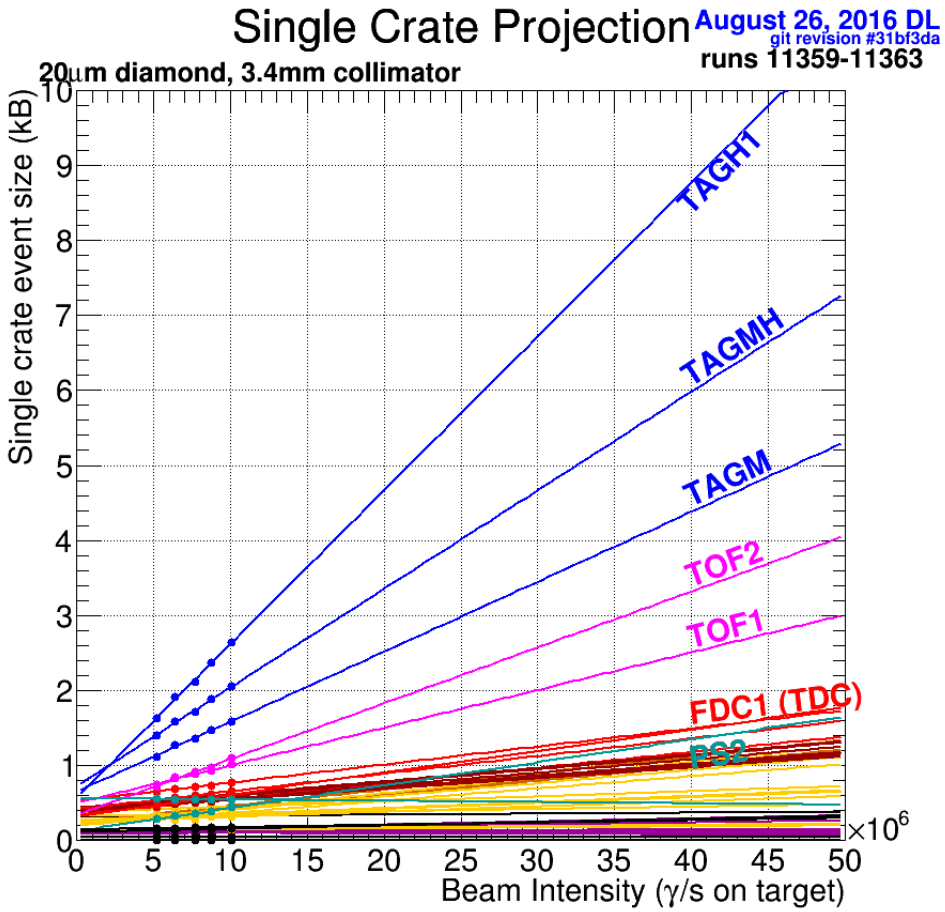
n.b. L3 review presentation assumed L1 event rate would scale from 30kHz and thus, high intensity would correspond to ~190kHz. If we are able to tighten L1 trigger so that high intensity is only 100kHz then the FDC crates will be just inside of the VME hardware limit.

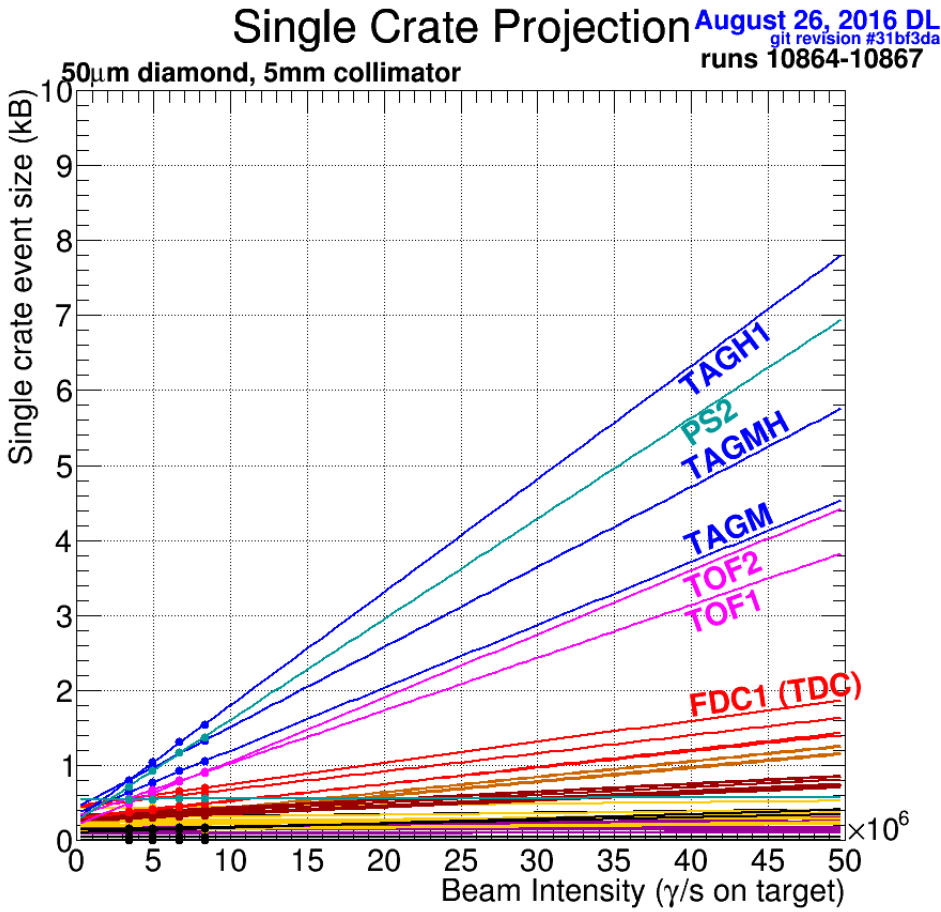




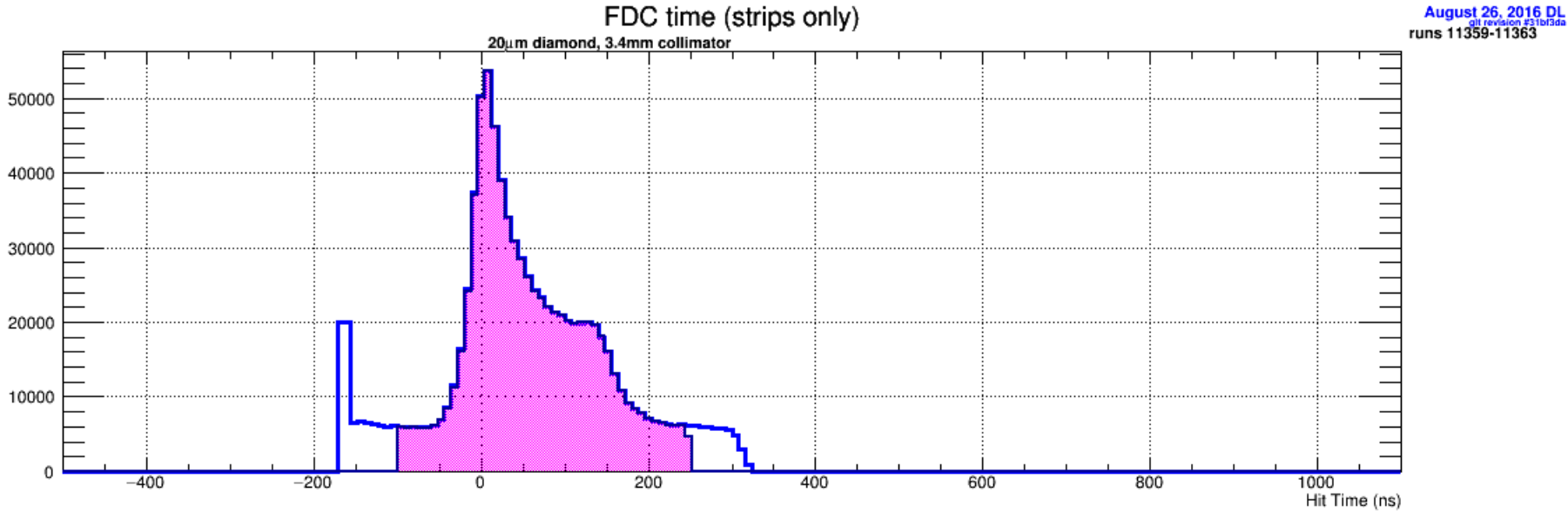
- These plots extrapolate the single crate, single event size to high luminosity
- Same technique described on previous slide for calculating beam intensity
- Assuming 100kHz L1 trigger for high intensity, 20μm data suggests ~150MB/s for FDC F1TDC crate

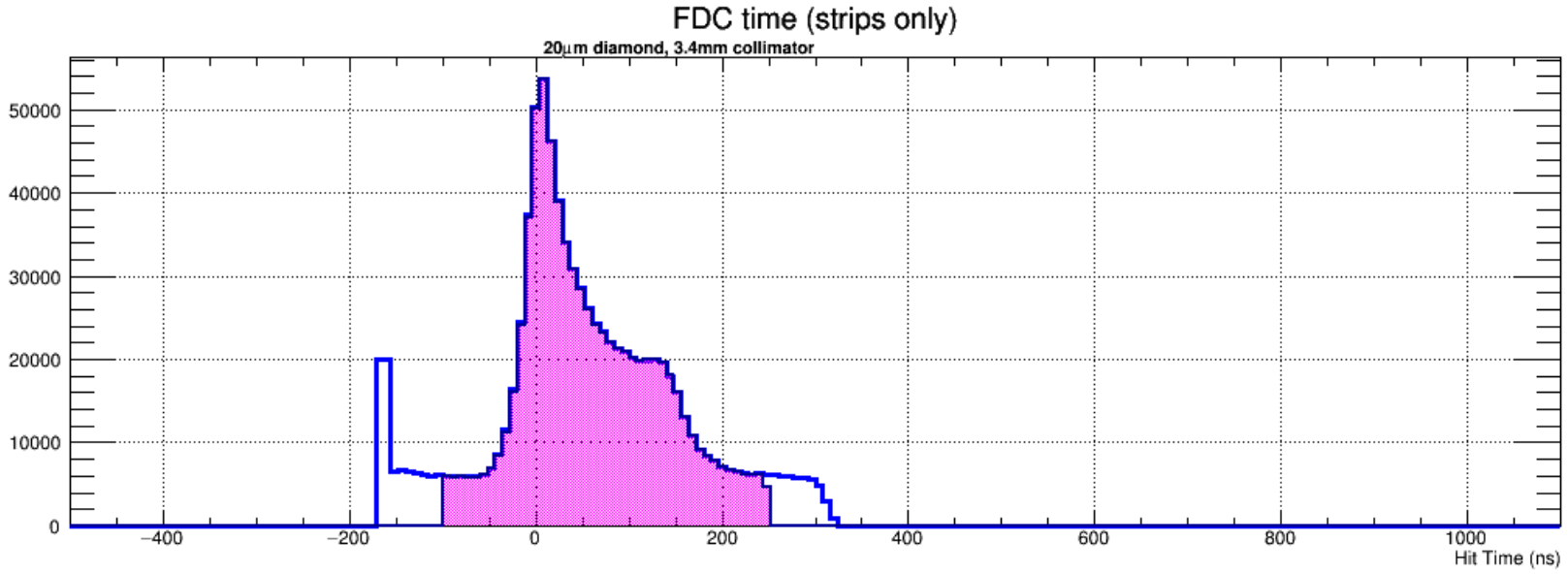
n.b. L3 review presentation assumed L1 event rate would scale from 30kHz and thus, high intensity would correspond to ~190kHz. If we are able to tighten L1 trigger so that high intensity is only 100kHz then the FDC crates will be just inside of the VME hardware limit.

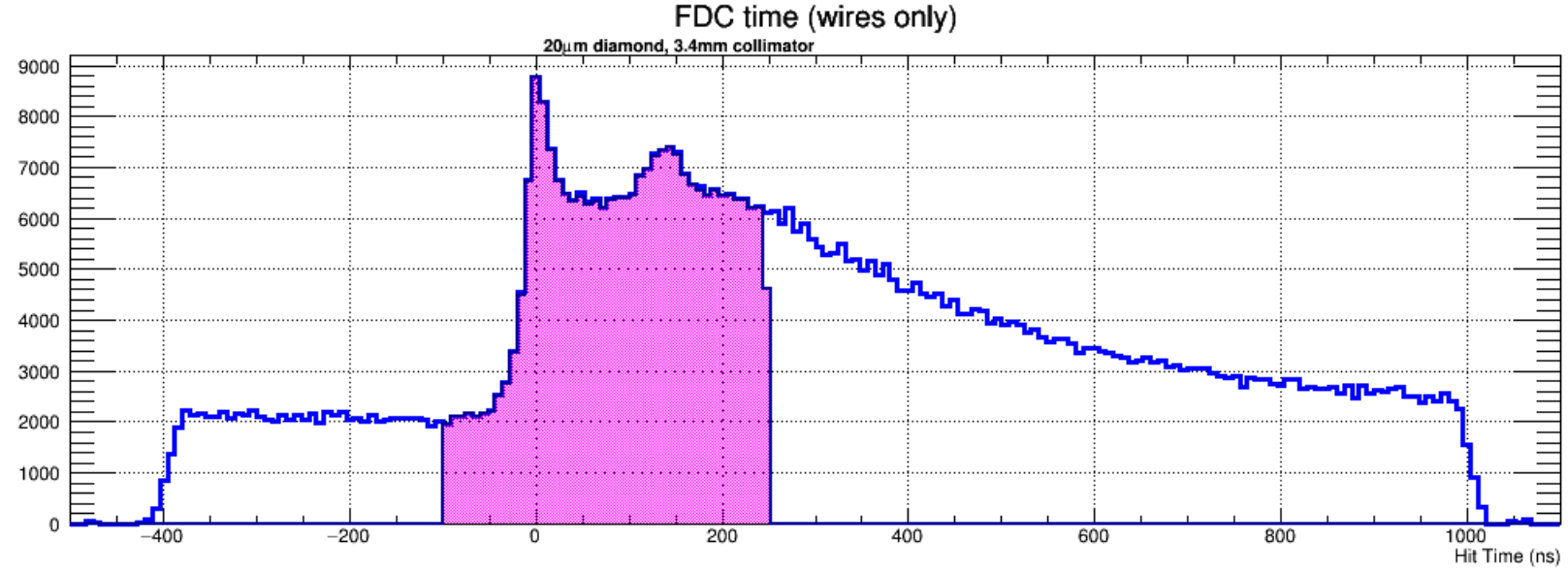


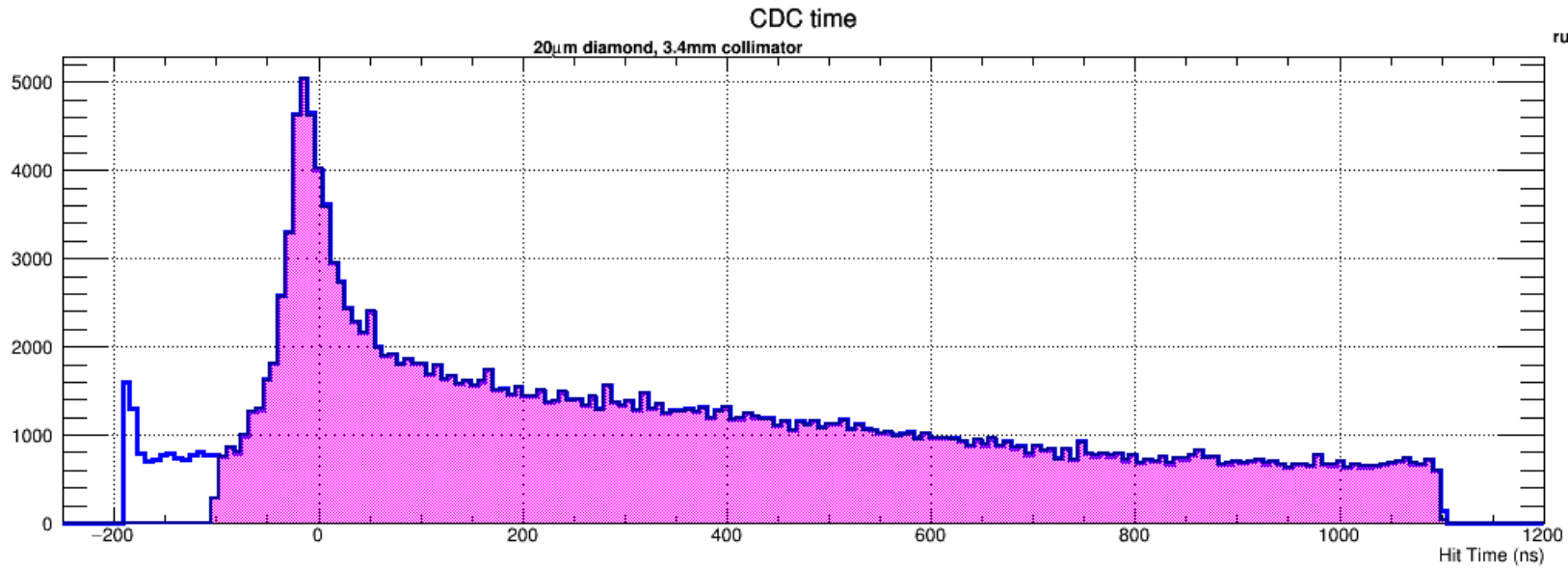


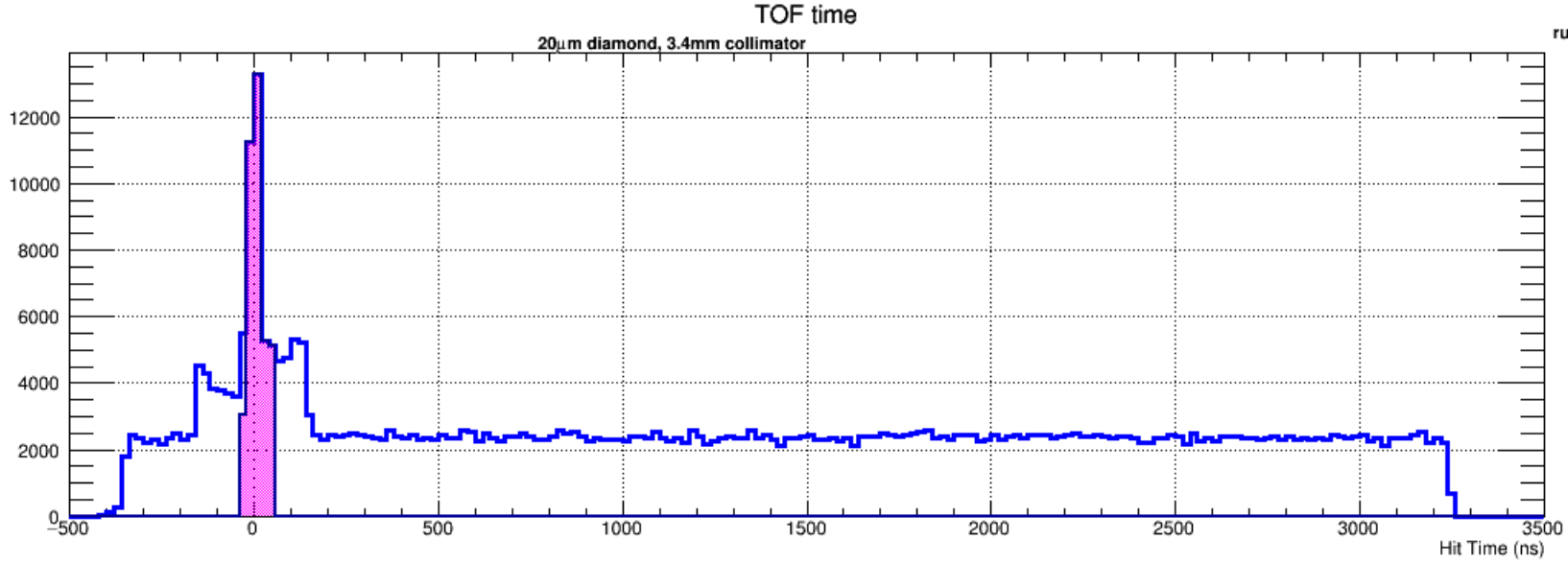
- Individual hits were excluded when writing out disentangled events to a new EVIO file
- Cut was made on fully calibrated times, referring back to digitized hit that created it
- Plot below and on following pages shows two histograms:
  - Blue outline is from EVIO file with all hits
  - Magenta filled is from disentangled EVIO file with hits cut

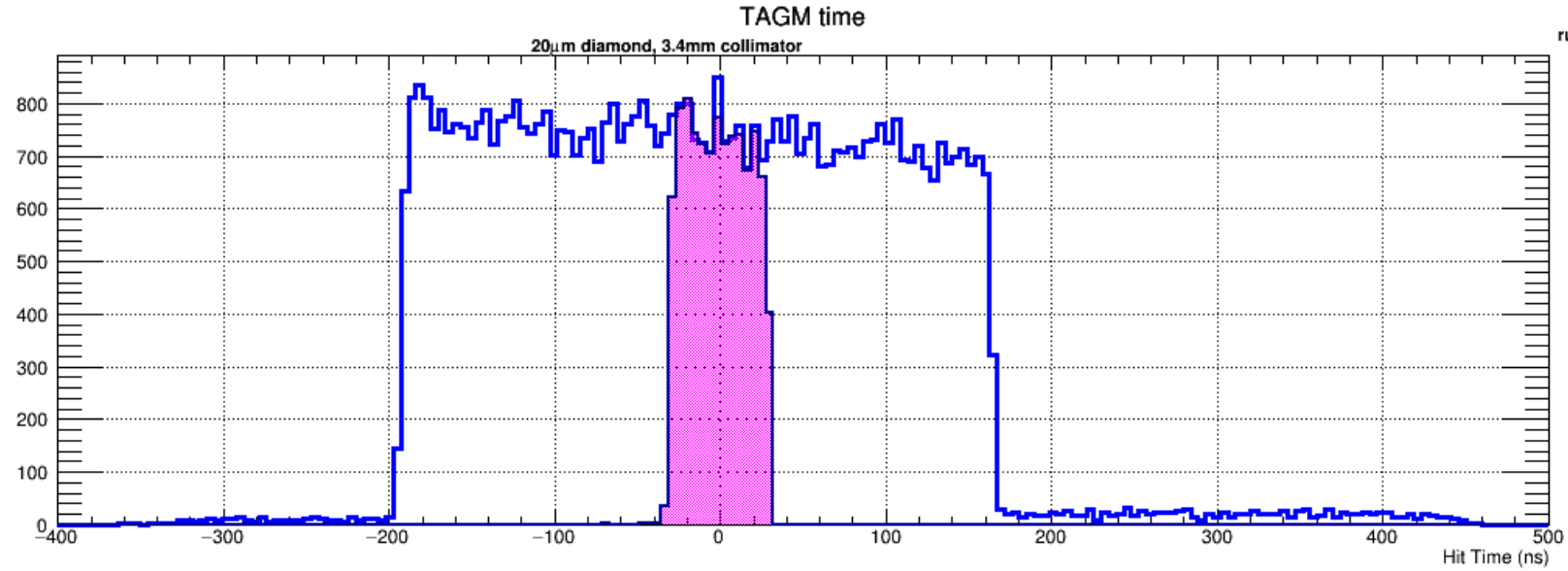


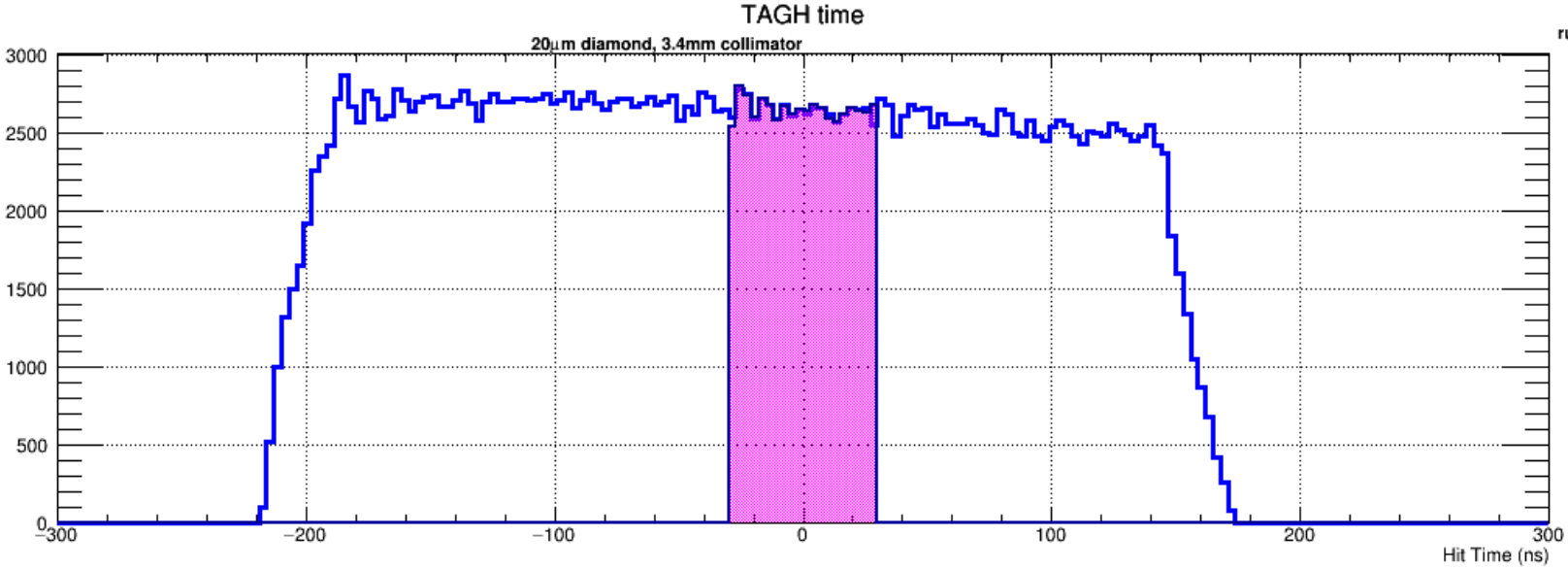

FDC time (strips only)
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
50000
40000
30000
20000
10000
0
−400
−200
0
200
400
600
800
1000
Hit Time (ns)


FDC time (wires only)
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
−400
−200
0
200
400
600
800
1000
Hit Time (ns)

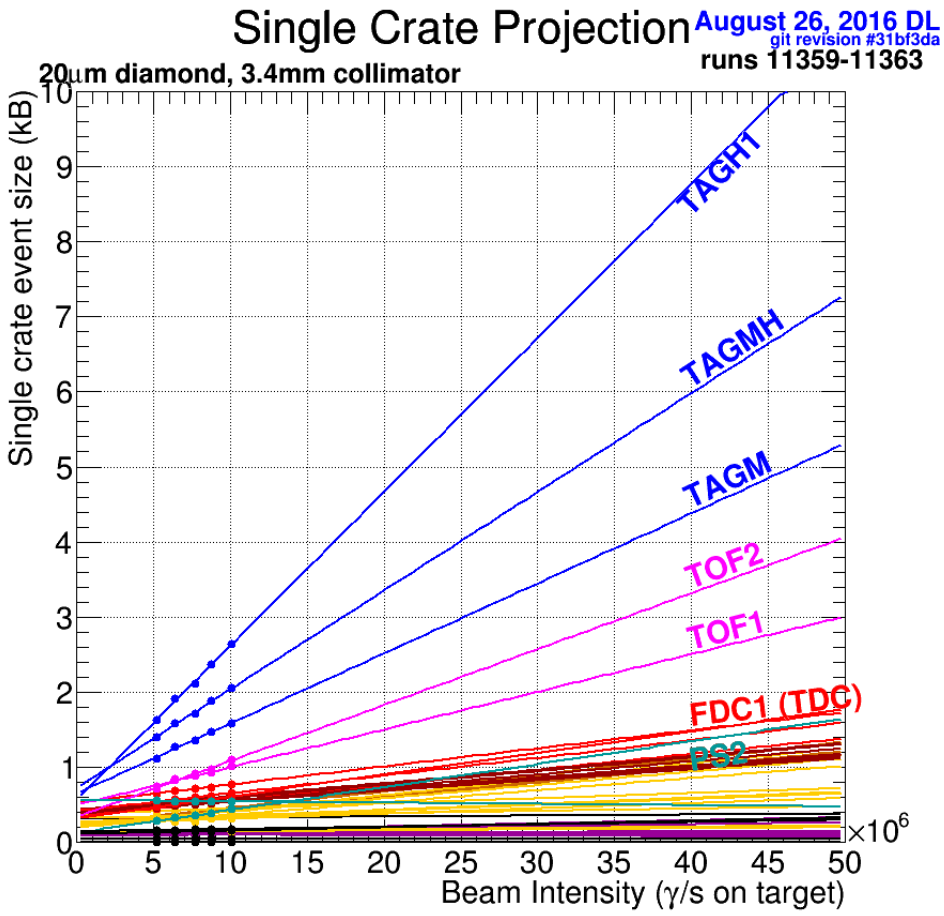

CDC time
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
5000
4000
3000
2000
1000
0
−200
0
200
400
600
800
1000
1200
Hit Time (ns)

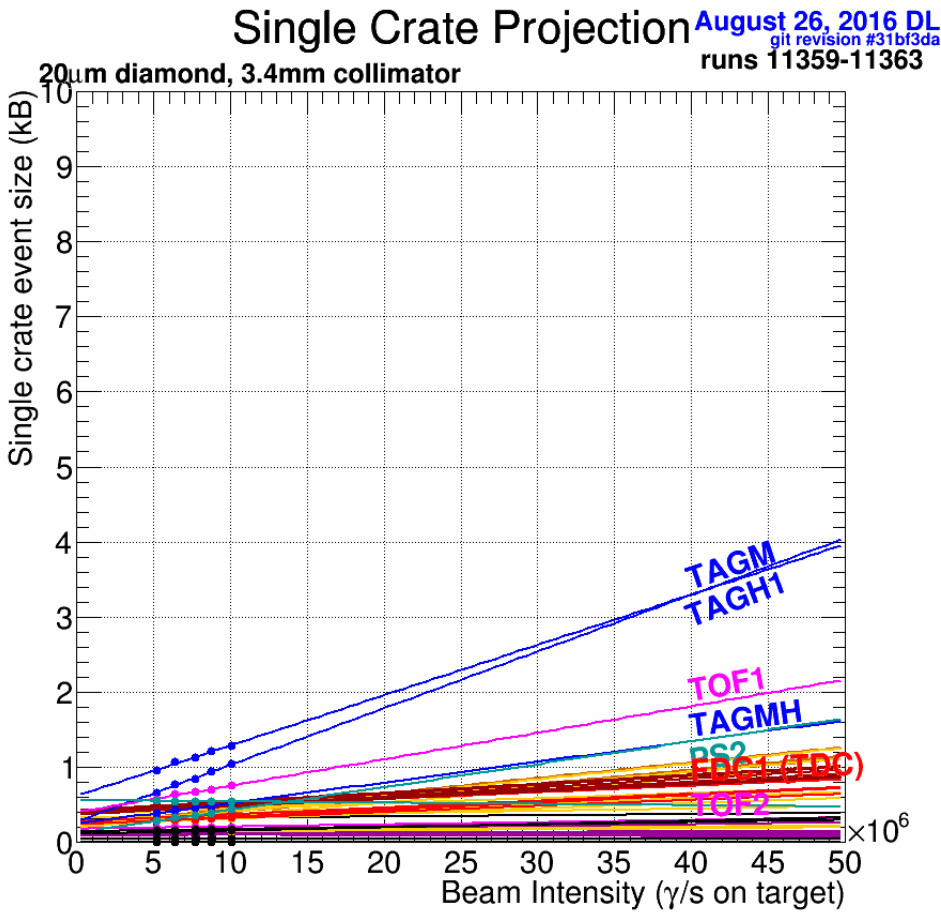

TOF time
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
12000
10000
8000
6000
4000
2000
0
−500
0
500
1000
1500
2000
2500
3000
3500
Hit Time (ns)


TAGM time
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
Hit Time (ns)

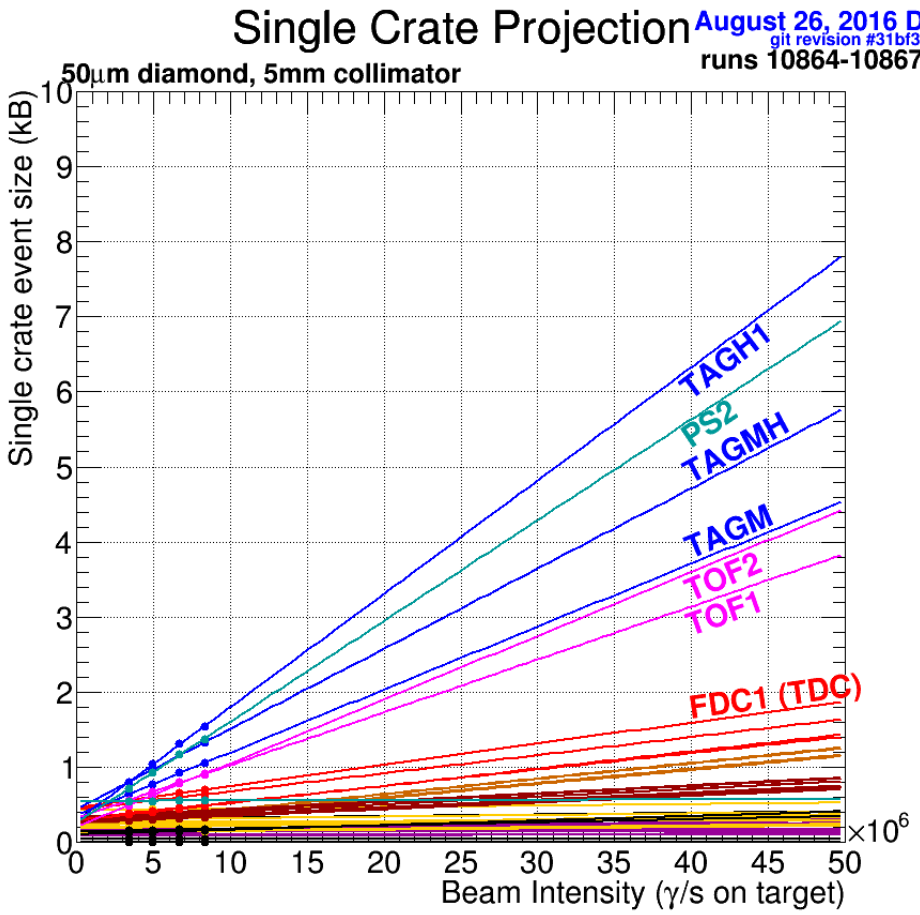

TAGH time
20μm diamond, 3.4mm collimator
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
Hit Time (ns)

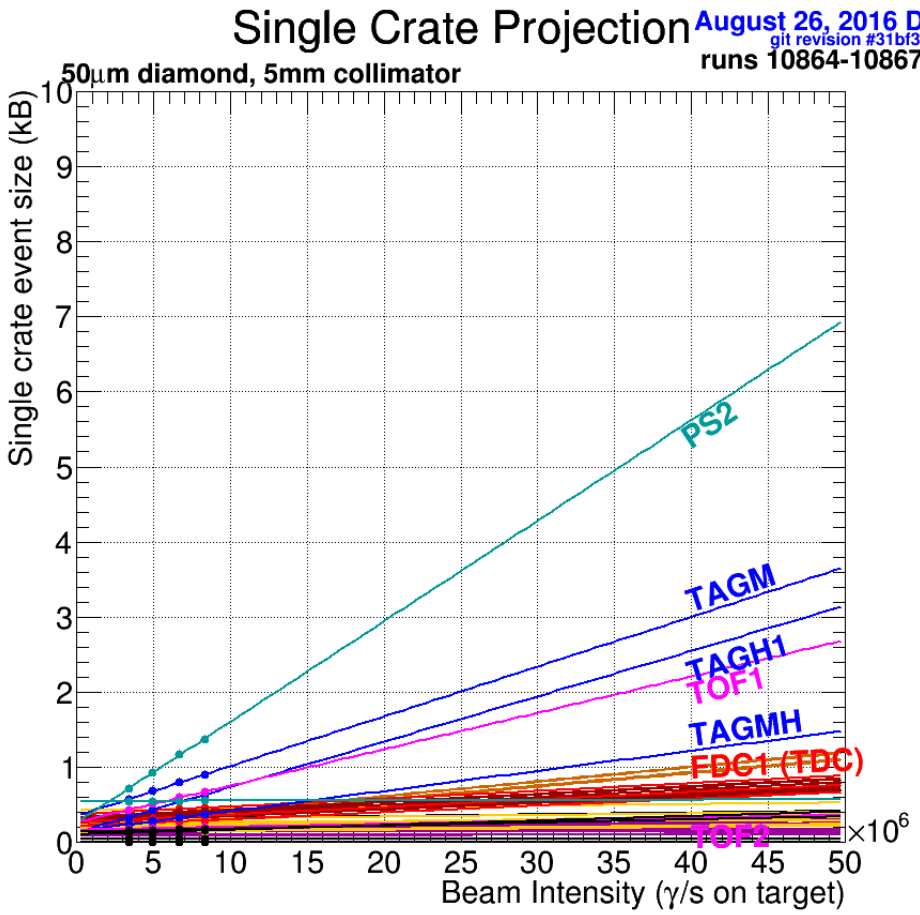
20μm, 3.4mm


Single Crate Projection
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
20μm diamond, 3.4mm collimator
Single crate event size (kB)
Beam Intensity (γ/s on target)
×10^6
TAGH1
TAGMH
TAGM
TOF2
TOF1
FDC1 (TDC)
PS2

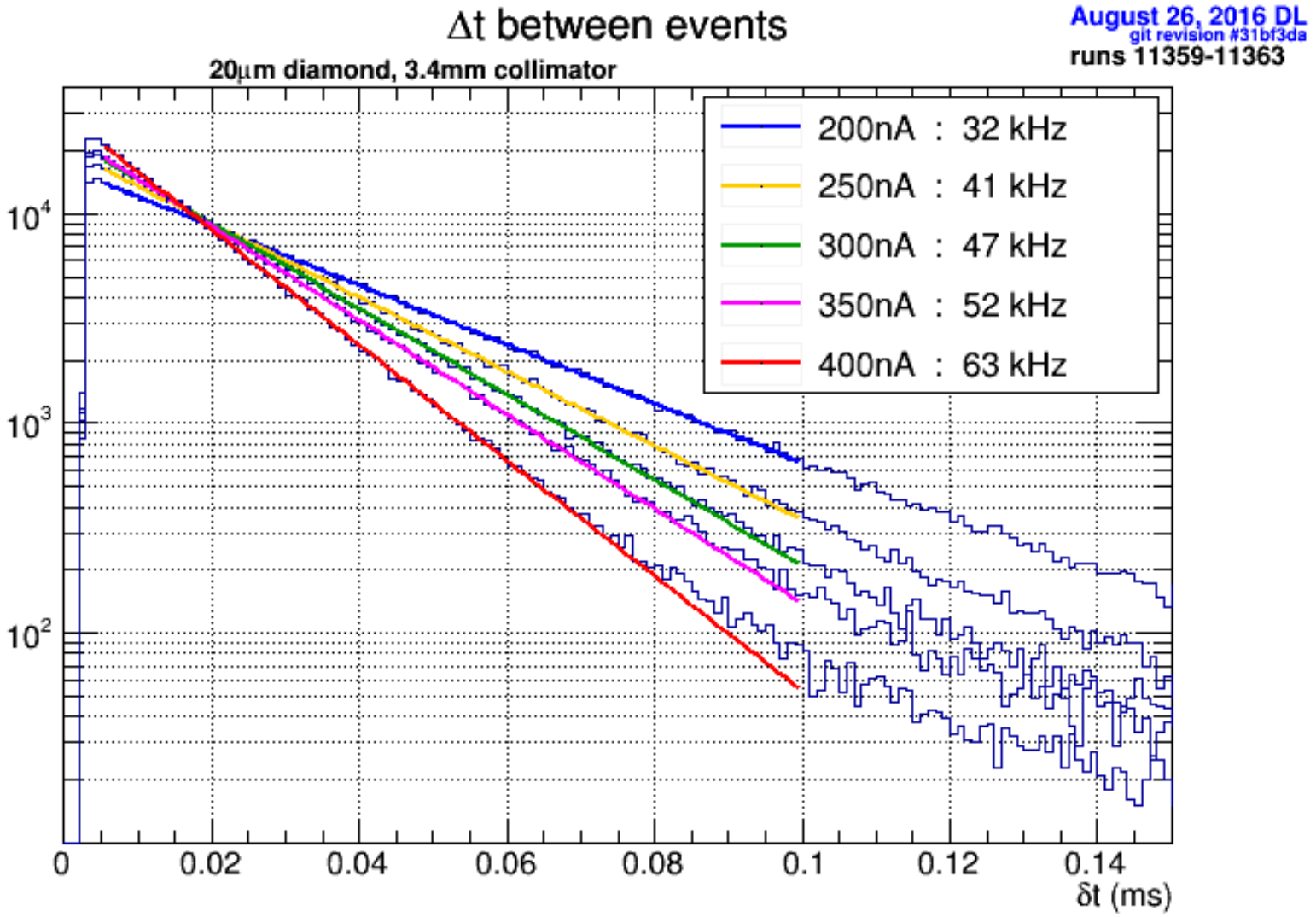

Single Crate Projection
August 26, 2016 DL
git revision #31bf3da
runs 11359-11363
20μm diamond, 3.4mm collimator
Single crate event size (kB)
Beam Intensity (γ/s on target)
×10^6
TAGM
TAGH1
TOF1
TAGMH
PS2
FDC1 (TDC)
TOF2

50μm, 5mm


Single Crate Projection
August 26, 2016 DL
git revision #31bf3da
runs 10864-10867
50μm diamond, 5mm collimator
Single crate event size (kB)
Beam Intensity (γ/s on target)
×10^6
TAGH1
PS2
TAGMH
TAGM
TOF2
TOF1
FDC1 (TDC)


Single Crate Projection
August 26, 2016 DL
git revision #31bf3da
runs 10864-10867
50μm diamond, 5mm collimator
Single crate event size (kB)
Beam Intensity (γ/s on target)
×10^6
PS2
TAGM
TAGH1
TOF1
TAGMH
FDC1 (TDC)
TOF2

- Working on extracting L1 trigger rate from time between events
- Dropping events based on stricter L1 trigger thresholds would allow estimate of L1 trigger rate with these existing data files



These are from 2 separate disentangled EVIO files

- Blue: All events
- Red: Only events where BCAL/FCAL trigger fired