

Configuration issue fixed

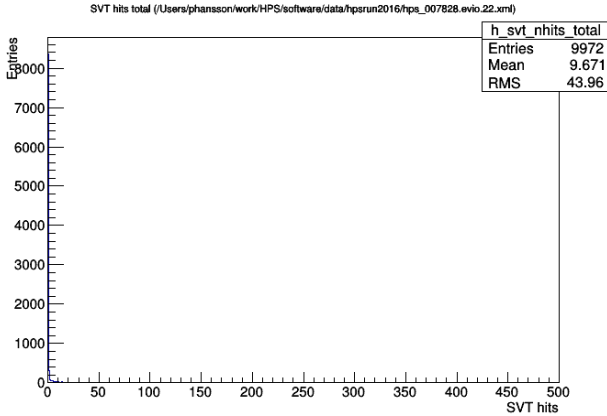
Timing and event size bank fixed

Software/firmware use releases (branched from DAQ group updates for now)

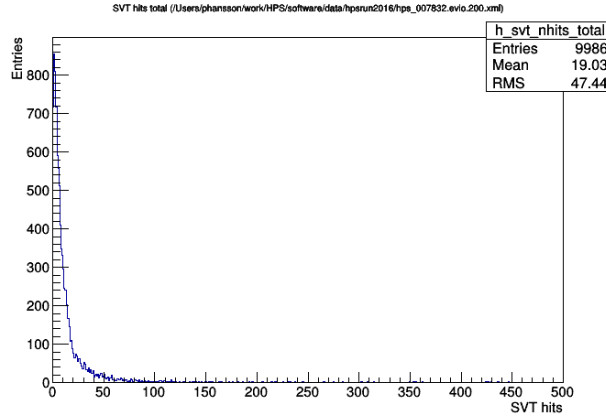
Testing

Event Size Testing

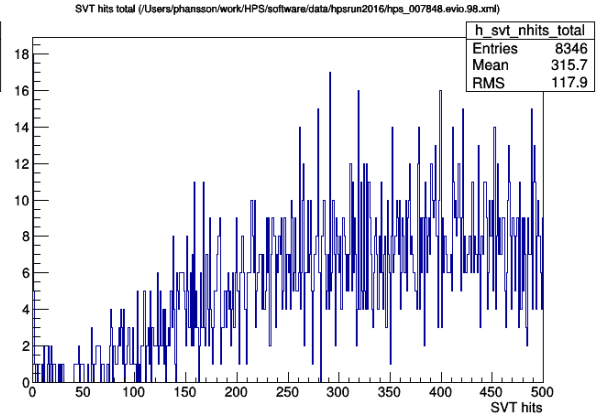
3S



2S



1S

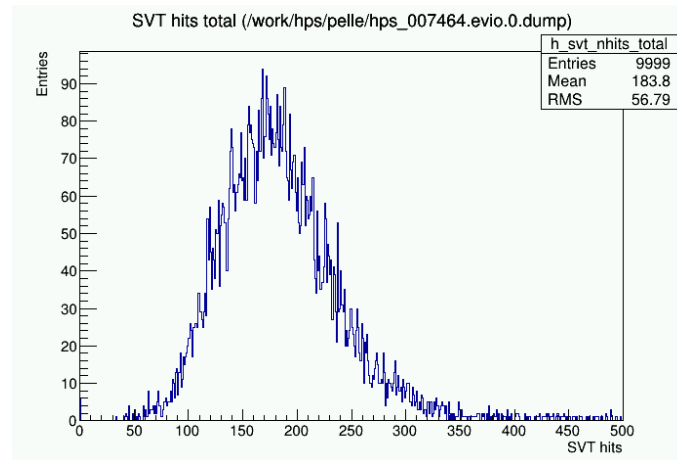


Run 7464

Special testing configuration incl. large ECal event sizes (similar/larger than w/ beam)

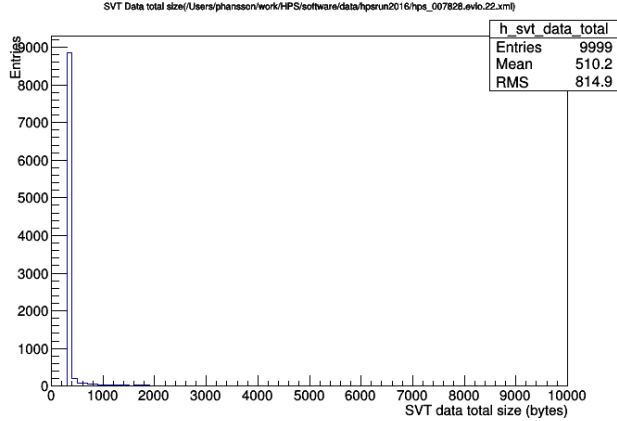
Random triggers from ECal

Look at overall livetime, individual busy sources, etc.

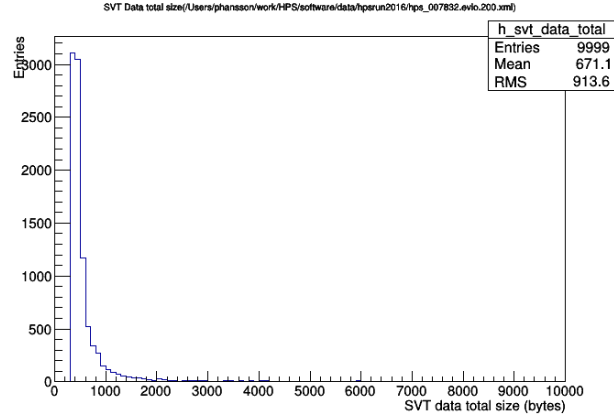


SVT Event Size

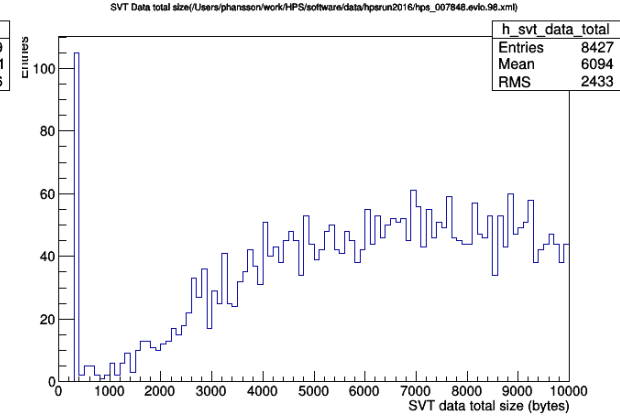
3S



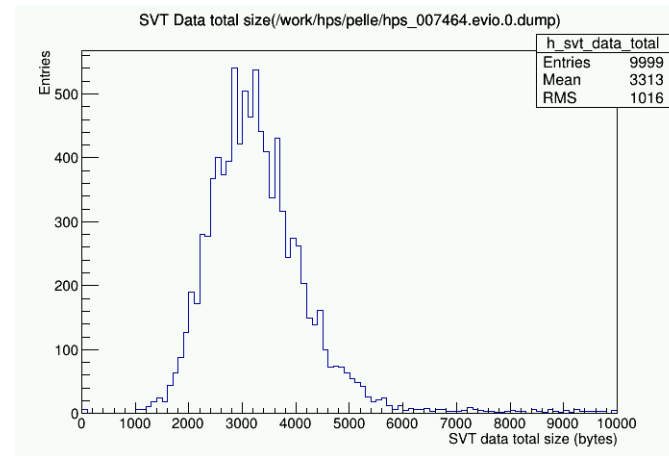
2S



1S

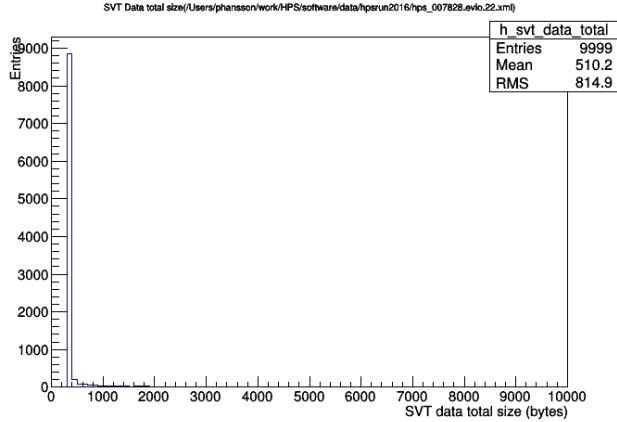


Run 7464

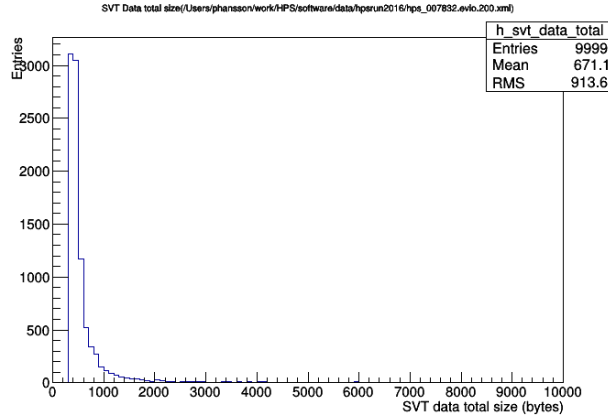


Event Size Testing

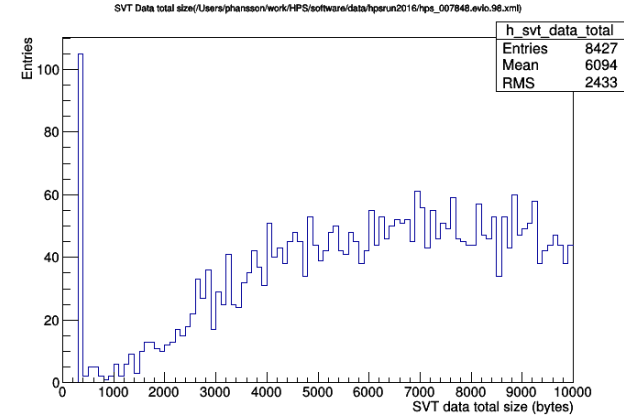
3S



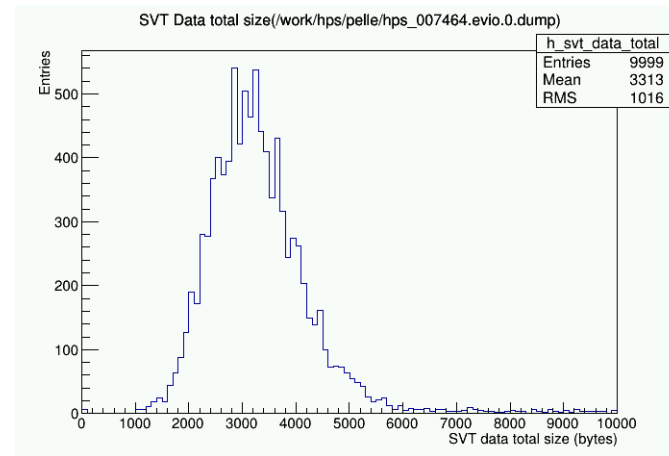
2S



1S

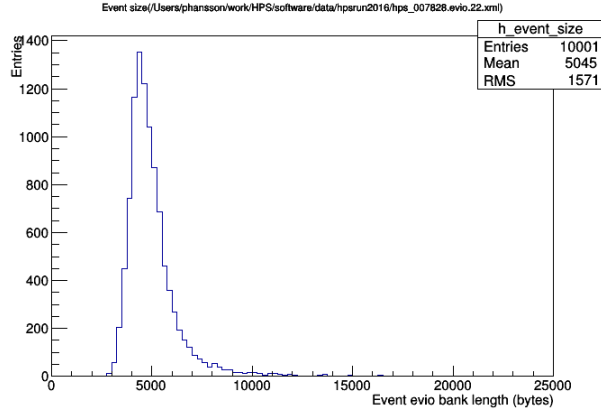


Run 7464

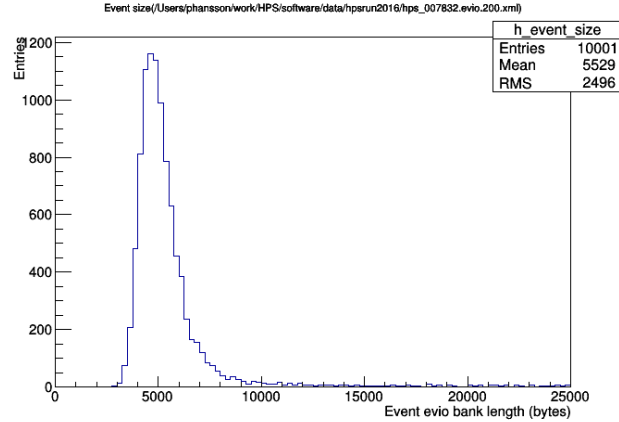


HPS Event Size

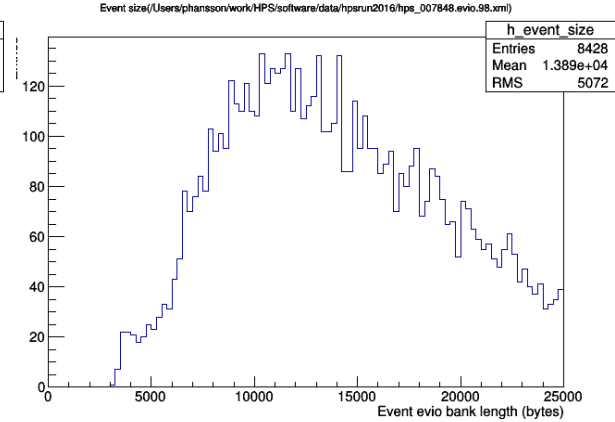
3S



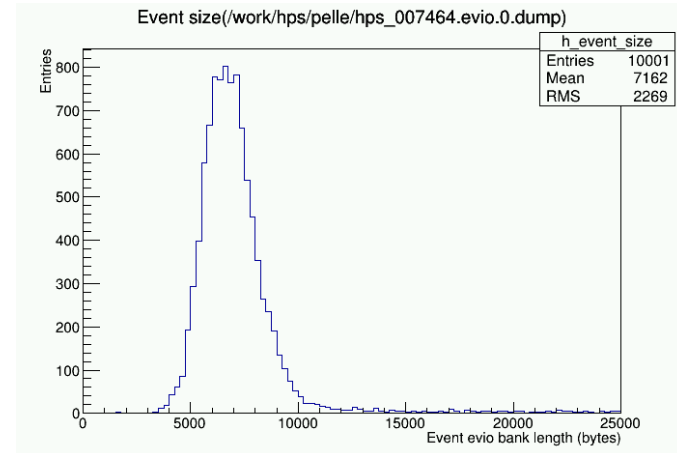
2S



1S



Run 7464



Event Size Testing

The screenshot displays the RunControl software interface for event size testing. The main window shows a table of scaler channels and a graph of event rates over time.

| | SINGLE 0 | SINGLE 1 | PAIR 0 | PAIR 1 | CHL18 | PULSER | TOTAL | Hz |
|-----------|----------|----------|--------|--------|-------|--------|---------|---------|
| UNGATED | 1831346 | 0 | 0 | 0 | 0 | 1000 | 1566805 | 1566805 |
| GATED | 1969916 | 0 | 0 | 0 | 0 | 889 | 1566805 | 1566805 |
| PRESCALED | 12139 | 0 | 0 | 0 | 0 | 889 | 13028 | 13028 |
| | 93 | 0 | 0 | 0 | 0 | 7 | 100 | 100 |

The graph shows event rates (Events/Sec) versus time (min). The y-axis ranges from 0 to 16000, and the x-axis ranges from -20 to 0. A sharp peak is visible at approximately -4 minutes, reaching a rate of about 15000 Events/Sec.

Below the graph, the 'Limits' section shows:

| Events | KBytes |
|--------|--------|
| 0 | 0 |

The 'Run progress' section shows:

| Events this run | Read From |
|-----------------|-----------|
| 4150492 | ER35 |

The 'Rates' section shows:

| Events/S | Rate (K/B/S) |
|------------|--------------------|
| 8683.0377 | 50748104670291.375 |
| 13639.0000 | 208589.2000 |

The 'RC - Konsole' window shows the following output:

```
Fiber 7 0x0388889a ( 59279514) [deadtime 27 percent]
Fiber 8 0x0388889a ( 59279514) [deadtime 27 percent]
-----
clasrun@clondaq3:clasrun> tcpClient hps11 'tiBusy()'
-----
Livetime 0x0392f0ec ( 59961580) [livetime 20 percent]
Total busy counter 0x0043c675 ( 4441717) [deadtime 7 percent]
-----
Busy Counters
SWA 0x00000000 ( 0) [deadtime 0 percent]
SWB 0x00000000 ( 0) [deadtime 0 percent]
P2 0x00000000 ( 0) [deadtime 0 percent]
FP-FTDC 0x00000000 ( 0) [deadtime 0 percent]
FP-FADC 0x00000000 ( 0) [deadtime 0 percent]
FP 0x004386a1 ( 4425377) [deadtime 7 percent]
Unused 0x00000000 ( 0) [deadtime 0 percent]
Loopack 0x0000c6ae ( 50862) [deadtime 0 percent]
Fiber 1 0x00024c5c ( 150620) [deadtime 0 percent]
Fiber 2 0x0001f6a5 ( 128677) [deadtime 0 percent]
Fiber 3 0x038e8d44 ( 59673924) [deadtime 27 percent]
Fiber 4 0x0006b4d9 ( 439513) [deadtime 0 percent]
Fiber 5 0x002a495a ( 2771290) [deadtime 4 percent]
Fiber 6 0x038e8d43 ( 59673923) [deadtime 27 percent]
Fiber 7 0x038e8d44 ( 59673924) [deadtime 27 percent]
Fiber 8 0x038e8d44 ( 59673924) [deadtime 27 percent]
-----
clasrun@clondaq3:clasrun>
-----
net_thread: waiting= 68 sending= 9 microsec per event (nev=1470)
net_thread: waiting= 76 sending= 9 microsec per event (nev=1310)
Poll, Trig Count 415444, Rate 1371, Size=4320, Bu=5922720 Bps
net_thread: waiting= 83 sending= 10 microsec per event (nev=1200)
net_thread: waiting= 88 sending= 7 microsec per event (nev=1130)
net_thread: waiting= 0 sending= 7 microsec per event (nev=1100)
net_thread: waiting= 85 sending= 8 microsec per event (nev=1170)
```

At ~13kHz with these huge events, SVT DAQ <5% busy with overall 10% livetime
With 2S thresholds SVT <2% busy always (up to 40kHz)

Event Size Testing

The screenshot displays the RunControl software interface for the experiment. The main window is titled 'MAKEHPSGREATAGAIN'. On the left, there is a 'RunControl' sidebar with various controls and a 'Static param Database' showing parameters like 'clsrun'. The central area features a graph of 'Events/Sec' vs 'Time (min)' showing a sharp peak at approximately -10 minutes. Below the graph, there are 'Limits' and 'Rates' sections. The 'Limits' section shows 'Events' and 'KBytes' both set to 0. The 'Rates' section shows 'Integrated' and 'Differential' rates for 'Events/S' and 'Rate (KB/S)'. The 'Differential' rates are 21529.0000 Events/S and 377814.3680 KB/S. The bottom right shows a console window with a list of fiber status and busy counters. The console output includes:

```
clsrun@clondaq3:~$ tcpClient hps11 'tiBusy()'

Livetime      0x05e81b2b ( 99097387) [livetime  2 percent]
Total busy counter 0x00a3137a ( 10687354) [deadtime 10 percent]

Busy Counters
SWA      0x00000000 ( 0) [deadtime  0 percent]
SWB      0x00000000 ( 0) [deadtime  0 percent]
P2       0x00000000 ( 0) [deadtime  0 percent]
FP-FTDC  0x00000000 ( 0) [deadtime  0 percent]
FP-FADC  0x00000000 ( 0) [deadtime  0 percent]
FP       0x0092662c ( 9594412) [deadtime  9 percent]
Unused   0x00000000 ( 0) [deadtime  0 percent]
Loopack  0x0001af29 ( 110377) [deadtime  0 percent]
Fiber 1  0x0004be73 ( 310899) [deadtime  0 percent]
Fiber 2  0x000449ea ( 281066) [deadtime  0 percent]
Fiber 3  0x063595cd ( 104175053) [deadtime 18 percent]
Fiber 4  0x00114c12 ( 1133586) [deadtime  1 percent]
Fiber 5  0x00699840 ( 6920256) [deadtime  6 percent]
Fiber 6  0x063595cc ( 104175052) [deadtime 18 percent]
Fiber 7  0x063595cd ( 104175053) [deadtime 18 percent]
Fiber 8  0x063595cd ( 104175053) [deadtime 18 percent]

clsrun@clondaq3:~$ tcpClient hps11 'tiSetInputPrescale(1,7)'
```

At 21~kHz with these huge events, SVT DAQ <5% busy, with overall ~50% livetime
With 2S thresholds SVT <2% busy always (up to 40kHz)

Preliminary Conclusions

SVT DAQ is stable with up to 4x occupancy

- No crashes (burn frames if sw not keeping up, 1G network in crate might be ultimate bottleneck, but we're not that close..)
- Multiple runs with >1M events
- One EB crash after 28M (Sergey is looking at it, rates are 400MB/s...)

SVT DAQ has only small contribution to busy

- <2% with smaller event sizes up to 35-40kHz
- ~5% at 4x beam occupancy at 21kHz