

2019 Production Reconstruction

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Reconstruction / Calibration Meeting

May 25, 2021

2019 “Good” Runs

- We have a preliminary list of 282 “good” runs broken into 278052 file partitions
- The “sample partitions” are 867 files ending in 041 and 042 which are intended as a faithful subset of the full run ($\sim 3\%$).
- Processed at JLab using:
 - Recent snapshot of hps-java
 - PhysicsRun2019FullRecon_pass0.lcsim
 - Runs both SeedTracker/GBL and Kalman Filter
 - Fits SVT data, but does not run tracking over events with greater than 200 SVT strip clusters (aka “monster” events)
 - HPS_PhysicsRun2019-v2-FEE-Pass0

Reconstruction Times

- For each run:
 - average the CPU times over the number of sample partitions for that run
 - multiply this average times the total number of partitions for that run
- Total time is then the sum over all the runs of the average time to reconstruct one partition times the number of partitions for that run.
- Total time: $1.56809e+06$ CPU hours
 - nb CPU/Wall ~ 1.0
- In good agreement with the estimate ($1.3e+06$) that Nathan had made.
- $1.6\text{M CPU hr} / (5.2\text{k CPU}) / (24 \text{ hr/day}) = 13 \text{ days at full Hall B fairshare}$

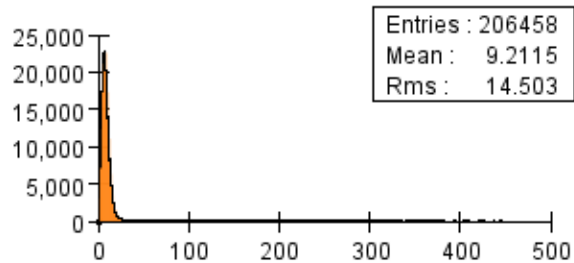
Recon Variants: Timing @ JLab

- Run short interactive jobs on ifarm1802
- Process 1000 events from early, clean run 10022
- Process 1000 events from later, busier run 10515

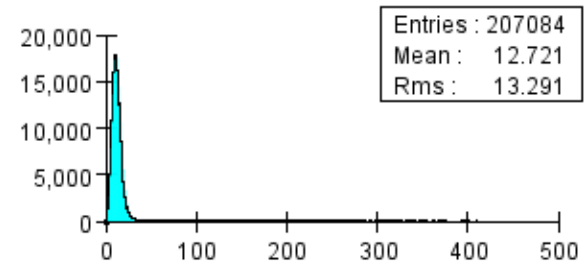
- Run current version of full reconstruction including SeedTracker/GBL and KF
- KF only, keeping large (>200 SVT hits) events
- KF only, skipping large (>200 SVT hits) events

hps_010022 Hits per event by sensor

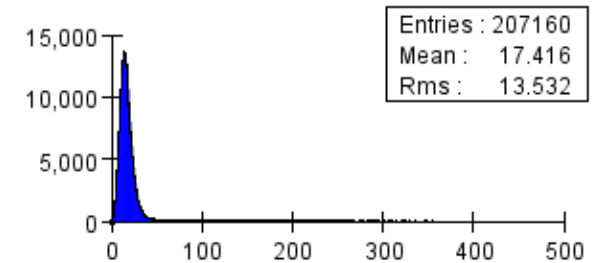
module_L1b_halfmodule_axial_sensor0 hits per ev...



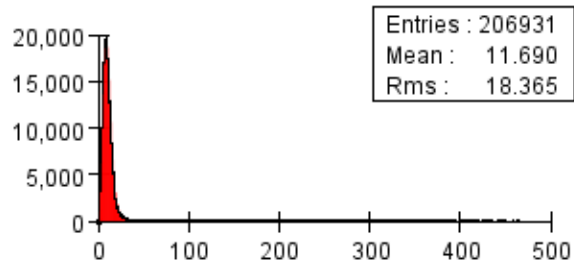
module_L1b_halfmodule_stereo_sensor0 hits per e...



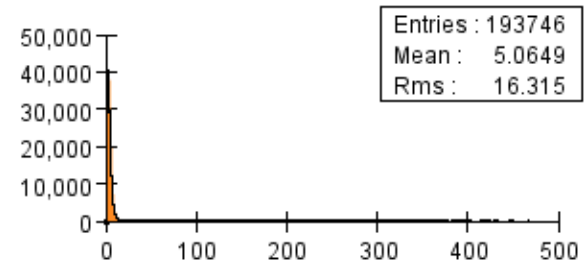
module_L1t_halfmodule_axial_sensor0 hits per event



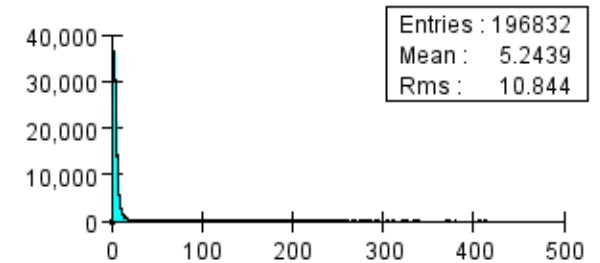
module_L1t_halfmodule_stereo_sensor0 hits per e...



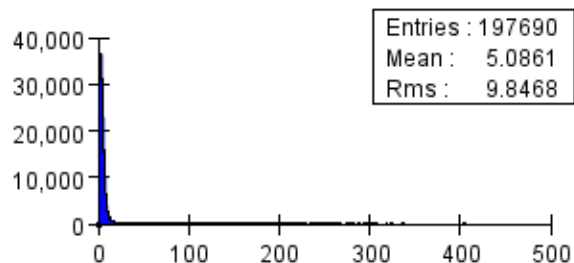
module_L2b_halfmodule_axial_sensor0 hits per ev...



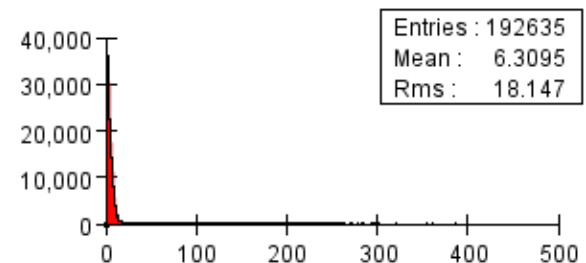
module_L2b_halfmodule_stereo_sensor0 hits per e...



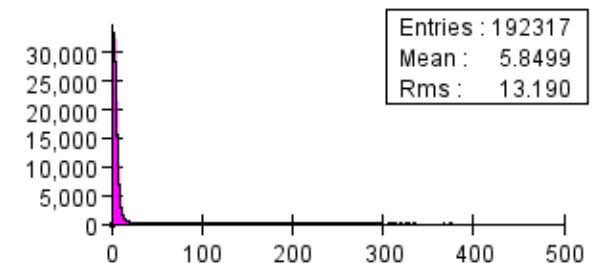
module_L2t_halfmodule_axial_sensor0 hits per event



module_L2t_halfmodule_stereo_sensor0 hits per e...

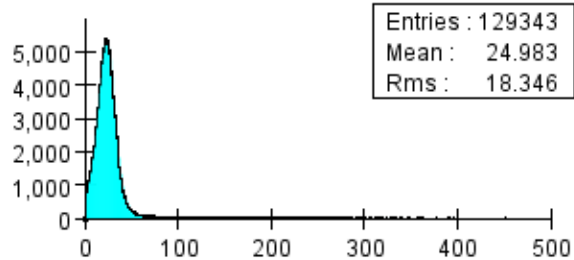


module_L3b_halfmodule_axial_sensor0 hits per ev...

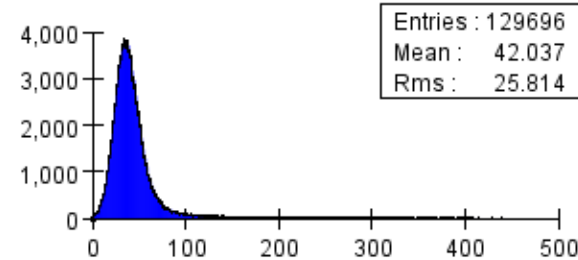


hps_010515 Hits per event by sensor

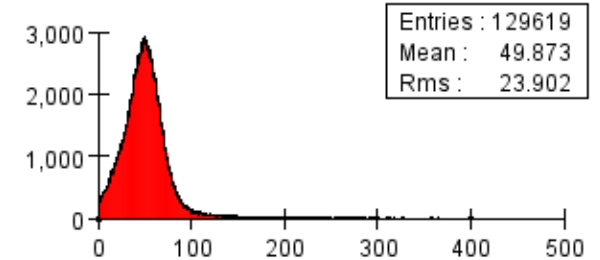
module_L1b_halfmodule_axial_sensor0 hits per ev...



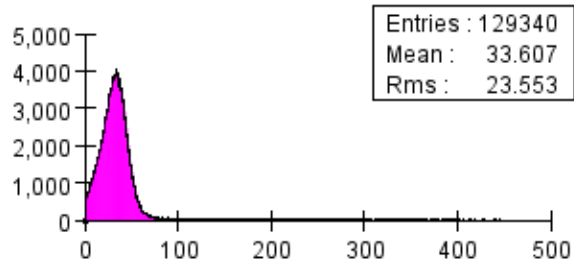
module_L1b_halfmodule_stereo_sensor0 hits per e...



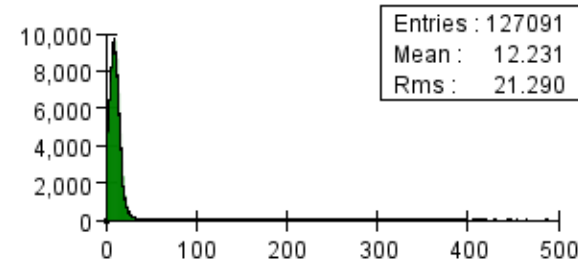
module_L1t_halfmodule_axial_sensor0 hits per event



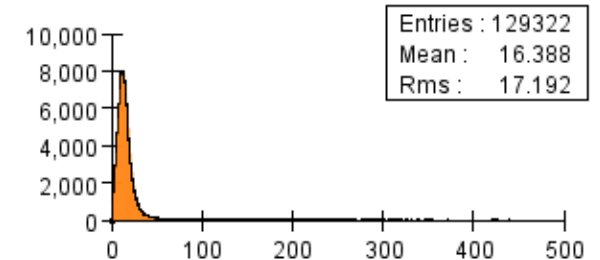
module_L1t_halfmodule_stereo_sensor0 hits per e...



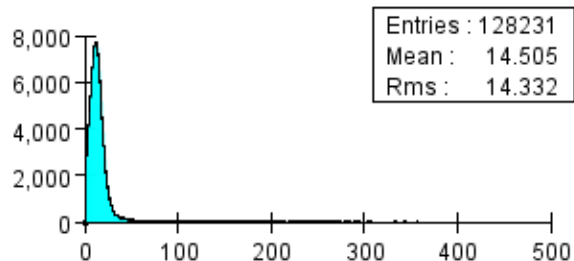
module_L2b_halfmodule_axial_sensor0 hits per ev...



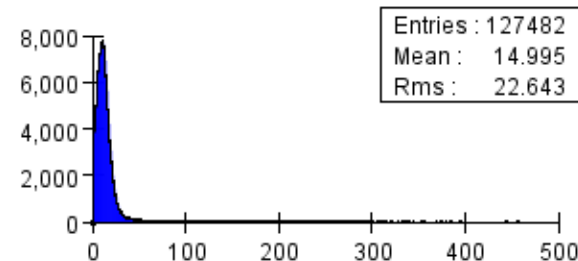
module_L2b_halfmodule_stereo_sensor0 hits per e...



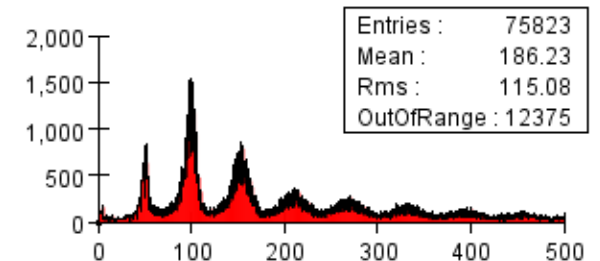
module_L2t_halfmodule_axial_sensor0 hits per event



module_L2t_halfmodule_stereo_sensor0 hits per e...



module_L3b_halfmodule_axial_sensor0 hits per ev...



Recon Timing @ JLab

- Run 10022:
 - master branch, full recon: 24.71 Hz
 - iss864, full recon: 25.23 Hz
 - iss864, KF only, skip monster events: 29.91 Hz
 - iss864, KF only, keep monster events: 18.84 Hz
- Run 10515
 - master branch, full recon: 9.03 Hz
 - iss864, full recon: 9.49 Hz
 - iss864, KF only, skip monster events: 10.48 Hz
 - iss864, KF only, keep monster events: 6.93 Hz

Recon Timing @ JLab

- Quite a bit of run-to-run variability
 - factor of ~3 between 22 and 515
- Quite a bit of “options” variability
 - factor of ~1.5 between keeping/skipping “monster” events
 - Surprised by the ST/GBL & KF tracking times
 - Need to double-check those numbers.
- Still some work to be done to finalize the reconstruction steering files
 - Adopt systematic approach under controlled circumstances
- Will process with `PhysicsRun2019_pass0_recon_evio.lcsim`
 - Include `EventFlagFilter` to handle SVT readout issues
 - Switch to `migrad` minimization
- But we appear to be in the ballpark in terms of reconstruction time.

Output File Size

- Critical path now shifts to output file size.
- We start with 278052 file partitions at 2GB giving us 556.104 TB
- What information do we NEED?
- What information do we WANT?
- How much can we keep disk-resident?
 - All the output files?
 - Only skims?
 - If so, which skims? trigger? recon?
- Do we want to be able to re-run (some of) the reconstruction on Icio output?

Output File Size

- Start by dropping whole collections
- If needed, drop individual objects from remaining collections
- If needed add extra collections or extra information to existing collections (e.g. TrackData)
- Will study the following scenarios:
 - Drop all “raw” hit collections
 - If we don't run ST/GBL, then we drop a number of hit and track collections automatically
 - Drop SVT fitted hits, keep only 1D strip clusters
 - Work our way up the chain...

First Pass

- Use run 010022 as example
- hps_010022.evio.00041 **2GB**
- evioToLcio **1.3GB**
- recon using hps-master
PhysicsRun2019FullRecon_pass0.lcsim
HPS_PhysicsRun2019-v2-FEE-Pass0 **4.8GB**

Current List of Collections

BeamspotConstrainedV0Candidates
BeamspotConstrainedV0Candidates_KF
BeamspotConstrainedV0Vertices
BeamspotConstrainedV0Vertices_KF
EcalCalHits
EcalClusters
EcalClustersCorr
EcalReadoutHits
EcalUncalHits
FADCGenericHits
FinalStateParticles
FinalStateParticles_KF
GBLKinkData
GBLKinkDataRelations
GBLTracks
HelicalTrackHitRelations
HelicalTrackHits
HodoCalHits
HodoGenericClusters
HodoReadoutHits
KFGBLStripClusterData
KFGBLStripClusterDataRelations
KFTrackData
KFTrackDataRelations
KalmanFullTracks
MatchedToGBLTrackRelations
MatchedTracks
OtherElectrons
OtherElectrons_KF
RFHits
RotatedHelicalTrackHitRelations
RotatedHelicalTrackHits
SVTFittedRawTrackerHits
SVTRawTrackerHits
SVTShapeFitParameters
StripClusterer_SiTrackerHitStrip1D
TSBank
TargetConstrainedV0Candidates
TargetConstrainedV0Candidates_KF
TargetConstrainedV0Vertices
TargetConstrainedV0Vertices_KF
TrackData
TrackDataRelations
TriggerBank
UnconstrainedV0Candidates
UnconstrainedV0Candidates_KF
UnconstrainedV0Vertices
UnconstrainedV0Vertices_KF
UnconstrainedVcCandidates
UnconstrainedVcCandidates_KF
UnconstrainedVcVertices
UnconstrainedVcVertices_KF
VTPBank

Keeping only these Collections 1.2GB

BeamspotConstrainedV0Candidates_KF

BeamspotConstrainedV0Vertices_KF

EcalClustersCorr

FinalStateParticles_KF

HodoCalHits

HodoGenericClusters

KFTrackData

KFTrackDataRelations

KalmanFullTracks

OtherElectrons_KF

RFHits

StripClusterer_SiTrackerHitStrip1D

TSBank

TargetConstrainedV0Candidates_KF

TargetConstrainedV0Vertices_KF

TriggerBank

UnconstrainedV0Candidates_KF

UnconstrainedV0Vertices_KF

VTPBank

Keeping only these Collections 0.58GB

BeamspotConstrainedV0Candidates_KF

BeamspotConstrainedV0Vertices_KF

EcalClustersCorr

FinalStateParticles_KF

HodoCalHits

HodoGenericClusters

KFTrackData

KFTrackDataRelations

KalmanFullTracks

OtherElectrons_KF

RFHits

TSBank

TargetConstrainedV0Candidates_KF

TargetConstrainedV0Vertices_KF

TriggerBank

UnconstrainedV0Candidates_KF

UnconstrainedV0Vertices_KF

VTPBank

Input Needed

- First crude pass to investigate what can be done easily.
- Could drop “monster” events completely.
- Instead of dropping all SVT strip clusters, could also drop individual strips not in the fiducial region of the track-finding (low amplitude, early/late times, physical regions)
- Could also only keep skims on disk.
 - trigger skims? recon skims?
- Input from analysis group and individuals doing analysis is clearly needed.

Backup

Master Branch Full Recon

Master Branch, Run 10022

PhysicsRun2019FullRecon_pass0.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/master/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x /org/hps/steering/recon/PhysicsRun2019FullRecon_pass0.lcsim -r -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=out_master -n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010022/hps_010022.evio.00041
```

```
Event: 8588578, Run: 10022, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz
Event: 8588678, Run: 10022, Sequence: 200, 44.44 ms/event, 22.50 Hz, Avg: 19.66 Hz
Event: 8588778, Run: 10022, Sequence: 300, 49.76 ms/event, 20.10 Hz, Avg: 19.80 Hz
org.hps.recon.tracking.kalman.KalTrack:WARNING KalTrack error: not enough hits (4) on the candidate track (ID::101) for event 8588856
Event: 8588878, Run: 10022, Sequence: 400, 32.91 ms/event, 30.39 Hz, Avg: 21.69 Hz
Event: 8588978, Run: 10022, Sequence: 500, 40.81 ms/event, 24.50 Hz, Avg: 22.20 Hz
Event: 8589078, Run: 10022, Sequence: 600, 33.71 ms/event, 29.66 Hz, Avg: 23.17 Hz
Event: 8589178, Run: 10022, Sequence: 700, 27.25 ms/event, 36.70 Hz, Avg: 24.46 Hz
Event: 8589278, Run: 10022, Sequence: 800, 42.26 ms/event, 23.66 Hz, Avg: 24.36 Hz
Event: 8589378, Run: 10022, Sequence: 900, 30.33 ms/event, 32.97 Hz, Avg: 25.09 Hz
Event: 8589478, Run: 10022, Sequence: 1000, 45.99 ms/event, 21.75 Hz, Avg: 24.71 Hz
org.hps.evio:INFO maxEvents 1000 was reached
KalmanPatRecDriver.endOfData: total pattern recognition execution time= 3385.3315 ms for 1000 events and 1041 tracks.
    Kalman Patrec Time per event = 3.3853 ms; Time per track = 3.2520 ms
    Kalman Patrec maximum time for one event = 185.2990 ms
    Kalman Interface Time per event = 0.2781 ms
KalmanInterface::summary: number of events with > 200 hits=0.
    Maximum event size = 146 strip hits.
    Events with > 0 hits were not processed.
    Number of tracks with bad covariance in filterTrack= 0 0
    Number of tracks with bad covariance in KalTrack.fit=2 8
org.hps.evio:INFO Job finished successfully!
```

iss864 Full Recon

iss864 Branch, Run 10022

PhysicsRun2019FullRecon_pass0.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x /org/hps/steering/recon/PhysicsRun2019FullRecon_pass0.lcsim -r -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=out_iss864 -n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010022/hps_010022.evio.00041
```

Event: 8588578, Run: 10022, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz

Event: 8588678, Run: 10022, Sequence: 200, 42.71 ms/event, 23.42 Hz, Avg: 22.36 Hz

Event: 8588778, Run: 10022, Sequence: 300, 44.47 ms/event, 22.49 Hz, Avg: 22.40 Hz

org.hps.recon.tracking.kalman.KalTrack:WARNING KalTrack error: not enough hits (4) on the candidate track (ID::101) for event 8588856

Event: 8588878, Run: 10022, Sequence: 400, 30.77 ms/event, 32.50 Hz, Avg: 24.29 Hz

Event: 8588978, Run: 10022, Sequence: 500, 43.08 ms/event, 23.21 Hz, Avg: 24.06 Hz

Event: 8589078, Run: 10022, Sequence: 600, 33.99 ms/event, 29.42 Hz, Avg: 24.82 Hz

Event: 8589178, Run: 10022, Sequence: 700, 27.60 ms/event, 36.24 Hz, Avg: 25.99 Hz

Event: 8589278, Run: 10022, Sequence: 800, 43.44 ms/event, 23.02 Hz, Avg: 25.57 Hz

Event: 8589378, Run: 10022, Sequence: 900, 34.55 ms/event, 28.95 Hz, Avg: 25.91 Hz

Event: 8589478, Run: 10022, Sequence: 1000, 48.92 ms/event, 20.44 Hz, Avg: 25.23 Hz

org.hps.evio:INFO maxEvents 1000 was reached

KalmanPatRecDriver.endOfData: total pattern recognition execution time= 3280.6351 ms for 1000 events and 1041 tracks.

Kalman Patrec Time per event = 3.2806 ms; Time per track = 3.1514 ms

Kalman Patrec maximum time for one event = 205.9116 ms

Kalman Interface Time per event = 0.2846 ms

KalmanInterface::summary: number of events with > 200 hits=0.

Maximum event size = 146 strip hits.

Events with > 0 hits were not processed.

Number of tracks with bad covariance in filterTrack= 0 0

Number of tracks with bad covariance in KalTrack.fit=2 8

org.hps.evio:INFO Job finished successfully!

iss864 KF Only Skip Monster Events

iss864 Branch, , Run 10022

PhysicsRun2019_pass0_KFOnly_skipMonster.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x  
PhysicsRun2019_pass0_KFOnly_skipMonster.lcsim -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=out_iss864_KF_only_skipMonster -n  
1000 /cache/mss/hallb/hps/physrun2019/data/hps_010022/hps_010022.evio.00041
```

Event: 8588578, Run: 10022, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz

Event: 8588678, Run: 10022, Sequence: 200, 32.19 ms/event, 31.07 Hz, Avg: 27.67 Hz

Event: 8588778, Run: 10022, Sequence: 300, 34.26 ms/event, 29.19 Hz, Avg: 28.16 Hz

org.hps.recon.tracking.kalman.KalTrack:WARNING KalTrack error: not enough hits (4) on the candidate track (ID::101) for event 8588856

Event: 8588878, Run: 10022, Sequence: 400, 31.86 ms/event, 31.39 Hz, Avg: 28.90 Hz

Event: 8588978, Run: 10022, Sequence: 500, 39.28 ms/event, 25.46 Hz, Avg: 28.14 Hz

Event: 8589078, Run: 10022, Sequence: 600, 31.03 ms/event, 32.23 Hz, Avg: 28.75 Hz

Event: 8589178, Run: 10022, Sequence: 700, 25.31 ms/event, 39.51 Hz, Avg: 29.91 Hz

Event: 8589278, Run: 10022, Sequence: 800, 38.29 ms/event, 26.12 Hz, Avg: 29.38 Hz

Event: 8589378, Run: 10022, Sequence: 900, 26.95 ms/event, 37.10 Hz, Avg: 30.07 Hz

Event: 8589478, Run: 10022, Sequence: 1000, 35.03 ms/event, 28.55 Hz, Avg: 29.91 Hz

org.hps.evio:INFO maxEvents 1000 was reached

KalmanPatRecDriver.endOfData: total pattern recognition execution time= 3858.9300 ms for 1000 events and 1041 tracks.

Kalman Patrec Time per event = 3.8589 ms; Time per track = 3.7069 ms

Kalman Patrec maximum time for one event = 303.5765 ms

Kalman Interface Time per event = 0.6004 ms

KalmanInterface::summary: number of events with > 200 hits=0.

Maximum event size = 146 strip hits.

Events with > 0 hits were not processed.

Number of tracks with bad covariance in filterTrack= 0 0

Number of tracks with bad covariance in KalTrack.fit=2 8

org.hps.evio:INFO Job finished successfully!

iss864 KF Only Keep Monster Events

Master Branch, Run 10022

PhysicsRun2019_pass0_KFOnly.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x PhysicsRun2019_pass0_KFOnly.lcsim -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=out_iss864_KF_only -n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010022/hps_010022.evio.00041
```

```
KalmanInterface::fillAllMeasurements: event 8588511 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 8588540 has > 500 hits!  
Event: 8588578, Run: 10022, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz  
KalmanInterface::fillAllMeasurements: event 8588668 has > 500 hits!  
Event: 8588678, Run: 10022, Sequence: 200, 135.77 ms/event, 7.37 Hz, Avg: 11.20 Hz  
KalmanInterface::fillAllMeasurements: event 8588708 has > 500 hits!  
Event: 8588778, Run: 10022, Sequence: 300, 98.03 ms/event, 10.20 Hz, Avg: 10.84 Hz  
org.hps.recon.tracking.kalman.KalTrack:WARNING KalTrack error: not enough hits (4) on the candidate track (ID::101) for event 8588856  
Event: 8588878, Run: 10022, Sequence: 400, 31.32 ms/event, 31.92 Hz, Avg: 12.99 Hz  
KalmanInterface::fillAllMeasurements: event 8588916 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 8588956 has > 500 hits!  
Event: 8588978, Run: 10022, Sequence: 500, 36.57 ms/event, 27.34 Hz, Avg: 14.51 Hz  
Event: 8589078, Run: 10022, Sequence: 600, 28.83 ms/event, 34.69 Hz, Avg: 16.07 Hz  
Event: 8589178, Run: 10022, Sequence: 700, 23.41 ms/event, 42.72 Hz, Avg: 17.64 Hz  
KalmanInterface::fillAllMeasurements: event 8589201 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 8589222 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 8589264 has > 500 hits!  
Event: 8589278, Run: 10022, Sequence: 800, 36.98 ms/event, 27.04 Hz, Avg: 18.44 Hz  
Event: 8589378, Run: 10022, Sequence: 900, 24.67 ms/event, 40.54 Hz, Avg: 19.63 Hz  
KalmanInterface::fillAllMeasurements: event 8589403 has > 500 hits!  
Event: 8589478, Run: 10022, Sequence: 1000, 72.43 ms/event, 13.81 Hz, Avg: 18.84 Hz  
org.hps.evio:INFO maxEvents 1000 was reached  
KalmanPatRecDriver.endOfData: total pattern recognition execution time= 24413.2395 ms for 1000 events and 1059 tracks.  
Kalman Patrec Time per event = 24.4132 ms; Time per track = 23.0531 ms  
Kalman Patrec maximum time for one event = 10254.0898 ms  
Kalman Interface Time per event = 0.6199 ms  
KalmanInterface::summary: number of events with > 200 hits=14.  
Maximum event size = 2147 strip hits.  
Events with > 0 hits were not processed.  
Number of tracks with bad covariance in filterTrack= 0 4  
Number of tracks with bad covariance in KalTrack.fit=2 8  
org.hps.evio:INFO Job finished successfully!
```

Master Branch Full Recon

Master Branch, Run 10515

PhysicsRun2019FullRecon_pass0.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/master/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x  
/org/hps/steering/recon/PhysicsRun2019FullRecon_pass0.lcsim -r -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=hps_010515_out_master  
-n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010515/hps_010515.evio.00041
```

Event: 5387507, Run: 10515, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz

Can't find track intercept; aborting Track refit

org.hps.recon.tracking.gbl.GBLRefitterDriver:WARNING Null returned from MakeGblTracks.refitTrackWithTraj - aborting refit

Event: 5387607, Run: 10515, Sequence: 200, 108.05 ms/event, 9.25 Hz, Avg: 9.00 Hz

Event: 5387707, Run: 10515, Sequence: 300, 108.17 ms/event, 9.24 Hz, Avg: 9.08 Hz

Event: 5387807, Run: 10515, Sequence: 400, 118.72 ms/event, 8.42 Hz, Avg: 8.91 Hz

Event: 5387907, Run: 10515, Sequence: 500, 105.52 ms/event, 9.48 Hz, Avg: 9.02 Hz

Event: 5388007, Run: 10515, Sequence: 600, 111.00 ms/event, 9.01 Hz, Avg: 9.01 Hz

Event: 5388107, Run: 10515, Sequence: 700, 130.75 ms/event, 7.65 Hz, Avg: 8.79 Hz

Event: 5388207, Run: 10515, Sequence: 800, 103.26 ms/event, 9.68 Hz, Avg: 8.89 Hz

Event: 5388161, Run: 10515, Sequence: 900, 102.91 ms/event, 9.72 Hz, Avg: 8.98 Hz

Event: 5388407, Run: 10515, Sequence: 1000, 104.49 ms/event, 9.57 Hz, Avg: 9.03 Hz

org.hps.evio:INFO maxEvents 1000 was reached

KalmanPatRecDriver.endOfData: total pattern recognition execution time= 14150.7781 ms for 1000 events and 1201 tracks.

Kalman Patrec Time per event = 14.1508 ms; Time per track = 11.7825 ms

Kalman Patrec maximum time for one event = 353.6284 ms

Kalman Interface Time per event = 0.3190 ms

KalmanInterface::summary: number of events with > 200 hits=0.

Maximum event size = 200 strip hits.

Events with > 0 hits were not processed.

Number of tracks with bad covariance in filterTrack= 2 7

Number of tracks with bad covariance in KalTrack.fit=0 12

org.hps.evio:INFO Job finished successfully!

iss864 Full Recon

iss864 Branch, Run 10515

PhysicsRun2019FullRecon_pass0.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x /org/hps/steering/recon/PhysicsRun2019FullRecon_pass0.lcsim -r -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=hps_010515_out_iss864 -n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010515/hps_010515.evio.00041
```

Event: 5387507, Run: 10515, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz

Can't find track intercept; aborting Track refit

org.hps.recon.tracking.gbl.GBLRefitterDriver:WARNING Null returned from MakeGblTracks.refitTrackWithTraj - aborting refit

Event: 5387607, Run: 10515, Sequence: 200, 100.71 ms/event, 9.93 Hz, Avg: 9.54 Hz

Event: 5387707, Run: 10515, Sequence: 300, 105.97 ms/event, 9.44 Hz, Avg: 9.50 Hz

Event: 5387807, Run: 10515, Sequence: 400, 108.14 ms/event, 9.25 Hz, Avg: 9.44 Hz

Event: 5387907, Run: 10515, Sequence: 500, 99.83 ms/event, 10.02 Hz, Avg: 9.55 Hz

Event: 5388007, Run: 10515, Sequence: 600, 108.32 ms/event, 9.23 Hz, Avg: 9.49 Hz

Event: 5388107, Run: 10515, Sequence: 700, 124.51 ms/event, 8.03 Hz, Avg: 9.25 Hz

Event: 5388207, Run: 10515, Sequence: 800, 99.70 ms/event, 10.03 Hz, Avg: 9.34 Hz

Event: 5388161, Run: 10515, Sequence: 900, 94.40 ms/event, 10.59 Hz, Avg: 9.47 Hz

Event: 5388407, Run: 10515, Sequence: 1000, 102.90 ms/event, 9.72 Hz, Avg: 9.49 Hz

org.hps.evio:INFO maxEvents 1000 was reached

KalmanPatRecDriver.endOfData: total pattern recognition execution time= 12504.5718 ms for 1000 events and 1201 tracks.

Kalman Patrec Time per event = 12.5046 ms; Time per track = 10.4118 ms

Kalman Patrec maximum time for one event = 282.6068 ms

Kalman Interface Time per event = 0.3090 ms

KalmanInterface::summary: number of events with > 200 hits=0.

Maximum event size = 200 strip hits.

Events with > 0 hits were not processed.

Number of tracks with bad covariance in filterTrack= 2 7

Number of tracks with bad covariance in KalTrack.fit=0 12

org.hps.evio:INFO Job finished successfully!

iss864 KF Only Skip Monster Events

iss864 Branch, , Run 10515

PhysicsRun2019_pass0_KFOnly_skipMonster.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x  
PhysicsRun2019_pass0_KFOnly_skipMonster.lcsim -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -  
DoutputFile=hps_010515_41_out_iss864_KF_only_skipMonster -n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010515/hps_010515.evio.00041
```

```
Event: 5387507, Run: 10515, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz  
Event: 5387607, Run: 10515, Sequence: 200, 91.79 ms/event, 10.89 Hz, Avg: 10.33 Hz  
Event: 5387707, Run: 10515, Sequence: 300, 93.83 ms/event, 10.66 Hz, Avg: 10.44 Hz  
Event: 5387807, Run: 10515, Sequence: 400, 102.44 ms/event, 9.76 Hz, Avg: 10.26 Hz  
Event: 5387907, Run: 10515, Sequence: 500, 93.51 ms/event, 10.69 Hz, Avg: 10.34 Hz  
Event: 5388007, Run: 10515, Sequence: 600, 83.13 ms/event, 12.03 Hz, Avg: 10.59 Hz  
Event: 5388107, Run: 10515, Sequence: 700, 94.13 ms/event, 10.62 Hz, Avg: 10.60 Hz  
Event: 5388207, Run: 10515, Sequence: 800, 96.66 ms/event, 10.35 Hz, Avg: 10.56 Hz  
Event: 5388161, Run: 10515, Sequence: 900, 92.70 ms/event, 10.79 Hz, Avg: 10.59 Hz  
Event: 5388407, Run: 10515, Sequence: 1000, 103.95 ms/event, 9.62 Hz, Avg: 10.48 Hz
```

org.hps.evio:INFO maxEvents 1000 was reached

KalmanPatRecDriver.endOfData: total pattern recognition execution time= 13379.5446 ms for 1000 events and 1201 tracks.

Kalman Patrec Time per event = 13.3795 ms; Time per track = 11.1403 ms

Kalman Patrec maximum time for one event = 319.4111 ms

Kalman Interface Time per event = 0.6089 ms

KalmanInterface::summary: number of events with > 200 hits=0.

Maximum event size = 200 strip hits.

Events with > 0 hits were not processed.

Number of tracks with bad covariance in filterTrack= 2 7

Number of tracks with bad covariance in KalTrack.fit=0 12

org.hps.evio:INFO Job finished successfully!

iss864 KF Only Keep Monster Events

Master Branch, Run 10515

PhysicsRun2019_pass0_KFOnly.lcsim

```
java -Xmx896m -Xms512m -cp /home/ngraf/work/git/devjars/iss864/hps-distribution-5.1-SNAPSHOT-bin.jar org.hps.evio.EvioToLcio -x PhysicsRun2019_pass0_KFOnly.lcsim -d HPS_PhysicsRun2019-v2-FEE-Pass0 -e 100 -DoutputFile=hps_010515_out_iss864_KF_only - ms n 1000 /cache/mss/hallb/hps/physrun2019/data/hps_010515/hps_010515.evio.00041
```

```
KalmanInterface::fillAllMeasurements: event 5387435 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387436 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387483 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387484 has > 500 hits!  
Event: 5387507, Run: 10515, Sequence: 100, 0.00 ms/event, 0.00 Hz, Avg: 0.00 Hz  
KalmanInterface::fillAllMeasurements: event 5387510 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387543 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387559 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387579 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387593 has > 500 hits!  
Event: 5387607, Run: 10515, Sequence: 200, 157.91 ms/event, 6.33 Hz, Avg: 6.19 Hz  
KalmanInterface::fillAllMeasurements: event 5387643 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387677 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387691 has > 500 hits!  
Event: 5387707, Run: 10515, Sequence: 300, 140.60 ms/event, 7.11 Hz, Avg: 6.47 Hz  
KalmanInterface::fillAllMeasurements: event 5387709 has > 500 hits!  
Event: 5387807, Run: 10515, Sequence: 400, 136.94 ms/event, 7.30 Hz, Avg: 6.66 Hz  
KalmanInterface::fillAllMeasurements: event 5387818 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387869 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387890 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387902 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5387904 has > 500 hits!  
Event: 5387907, Run: 10515, Sequence: 500, 139.91 ms/event, 7.15 Hz, Avg: 6.75 Hz  
KalmanInterface::fillAllMeasurements: event 5387994 has > 500 hits!  
Event: 5388007, Run: 10515, Sequence: 600, 109.78 ms/event, 9.11 Hz, Avg: 7.06 Hz  
KalmanInterface::fillAllMeasurements: event 5388065 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388073 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388096 has > 500 hits!  
Event: 5388107, Run: 10515, Sequence: 700, 123.44 ms/event, 8.10 Hz, Avg: 7.19 Hz  
KalmanInterface::fillAllMeasurements: event 5388137 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388170 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388202 has > 500 hits!
```

```
Event: 5388207, Run: 10515, Sequence: 800, 183.23 ms/event, 5.46 Hz, Avg: 6.92 Hz  
KalmanInterface::fillAllMeasurements: event 5388244 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388279 has > 500 hits!  
KalmanInterface::fillAllMeasurements: event 5388284 has > 500 hits!  
Event: 5388161, Run: 10515, Sequence: 900, 145.13 ms/event, 6.89 Hz, Avg: 6.91 Hz  
KalmanInterface::fillAllMeasurements: event 5388389 has > 500 hits!  
Event: 5388407, Run: 10515, Sequence: 1000, 141.34 ms/event, 7.08 Hz, Avg: 6.93 Hz  
org.hps.evio:INFO maxEvents 1000 was reached  
KalmanPatRecDriver.endOfData: total pattern recognition execution time= 60447.5640 ms for  
1000 events and 2727 tracks.  
Kalman Patrec Time per event = 60.4476 ms; Time per track = 22.1663  
  
Kalman Patrec maximum time for one event = 1269.8028 ms  
Kalman Interface Time per event = 0.8669 ms  
KalmanInterface::summary: number of events with > 200 hits=369.  
Maximum event size = 1744 strip hits.  
Events with > 0 hits were not processed.  
Number of tracks with bad covariance in filterTrack= 2 7  
Number of tracks with bad covariance in KalTrack.fit=0 23  
org.hps.evio:INFO Job finished successfully!
```