

Updates to Tracker Digitization

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Overview

- configure detector parameters independent of compact.xml file
 - strip pitch, transfer efficiencies, etc.
- configure all parameters of digitization algorithm (sisim)
 - cluster sizes, thresholds, etc.
- make easily steerable from recon xml for batch processing
- package: org.lcsim.recon.tracking.digitization.sisim.config
- example job: lcsim/testResources/^^^/digiTest.xml

Detector Setup Drivers

SiTrackerBarrelSetupDriver

SiTrackerEndcapSetupDriver

SiTrackerEndcap2SetupDriver

- readout pitch, sense pitch, transfer efficiencies (2 numbers)

SiVertexBarrelSetupDriver

SiVertexEndcapSetupDriver

- readout pitch x & y, sense pitch x & y, transfer efficiency (1 number)

Digi Configuration Drivers

- StripDigiSetupDriver
 - subdetectorNames, rawHitsCollectionName, trackerHitsCollectionName
 - maxClusterSize, noiseIntercept, noiseSlope, noiseThreshold, readoutNeighborThreshold, seedThreshold, neighborThreshold, centralStripAveragingThreshold, one/two/three/fourClusterErr
- PixelDigiSetupDriver (similar to above)

Detector Setup: Example XML

```
<driver name="TrackerBarrelSetup"  
  type="org.lcsim.recon.tracking.digitization.sisim.config.SiTrackerBarelSensorSetup"  
>  
  <subdetectorName>SiTrackerBarrel</subdetectorName>  
  <readoutElectrodesPitch>0.050</readoutElectrodesPitch>  
  <senseElectrodesPitch>0.025</senseElectrodesPitch>  
  <transferEfficiencies>0.986 0.419</transferEfficiencies>  
</driver>
```

Digi Config : Example XML

```
<driver name="TrackerDigi"  
  type="org.lcsim.recon.tracking.digitization.sisim.config.StripDigiSetupDriver">  
  <subdetectorNames>SiTrackerBarrel SiTrackerEndcap</subdetectorNames>  
  <rawHitsCollectionName>TKR_RawTrackerHits</rawHitsCollectionName>  
  <trackerHitsCollectionName>TKR_TrackerHits</trackerHitsCollectionName>  
  <maxClusterSize>10</maxClusterSize>  
  <noiseIntercept>300.</noiseIntercept>  
  <noiseSlope>30.</noiseSlope>  
  <noiseThreshold>9000.</noiseThreshold>  
  <readoutNeighborThreshold>9000.</readoutNeighborThreshold>  
  <seedThreshold>9000.</seedThreshold>  
  <neighborThreshold>9000.</neighborThreshold>  
  <centralStripAveragingThreshold>4</centralStripAveragingThreshold>  
  <oneClusterErr>0.288675135</oneClusterErr>  
  <twoClusterErr>0.2</twoClusterErr>  
  <threeClusterErr>0.333333333</threeClusterErr>  
  <fourClusterErr>0.5</fourClusterErr>  
  <fiveClusterErr>1.0</fiveClusterErr>  
</driver>
```

Example Batch Job: Execution

<execute>

<driver name="VertexBarrelSetup"/>

<driver name="VertexEndcapSetup"/>

<driver name="TrackerBarrelSetup"/>

<driver name="TrackerEndcapSetup"/>

Detector Setup

Link hits \leftrightarrow sensors

<driver name="ReadoutDriver"/>

Digitization

<driver name="TrackerDigi"/>

<driver name="VertexDigi"/>

Makes HelicalTrackHits

<driver name="TestTracking" />

Write LCIO File

<driver name="Writer"/>

</execute>

TODO

- xml jobs easily runnable from JAS3 for event display, debugging, etc.
- detector description drivers fully configurable including selection of p/n side, stereo angles, etc. (what else?)
- generate strategy file and run with seedtracking (only up to HelicalTrackHits right now)
- run on sidloi detector instead of test model