

Short Update on FCAL Software Status

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LumiCal Cluster Reconstruction

- Last updates were presented on WG meeting on March 16, 2015.
(<https://agenda.linearcollider.org/event/6706/>)
- Geometry is hard coded.
- Present implementation of the LumiCal reconstruction procedure does not make clear difference between the local and global coordinates.
- Solution is to use one single geometry implemented in DD4hep.

Modifications to LumiCal

```
[localhost fcal_trunk_110814]$ svn status
```

```
M    source/LumiCalReco/src/GlobalMethodsClass.cpp
M    source/LumiCalReco/src/LumiCalClusterer.cpp
M    source/LumiCalReco/src/LumiCalClusterer_buildClusters.cpp
M    source/LumiCalReco/src/LumiCalClusterer_buildClusters_auxiliary.cpp
M    source/LumiCalReco/src/LumiCalClusterer_getCalHits.cpp
```

Reconstruction in LumiCal

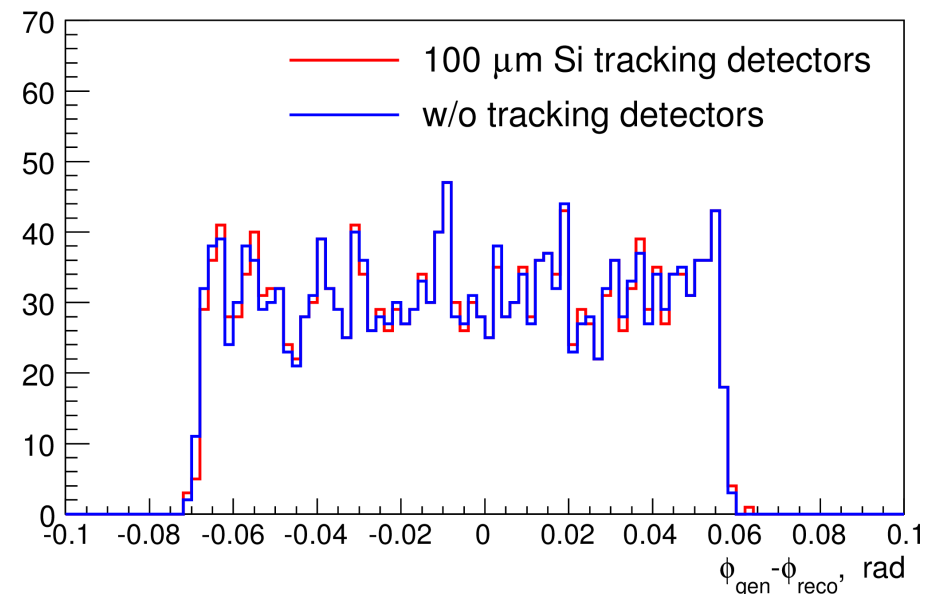
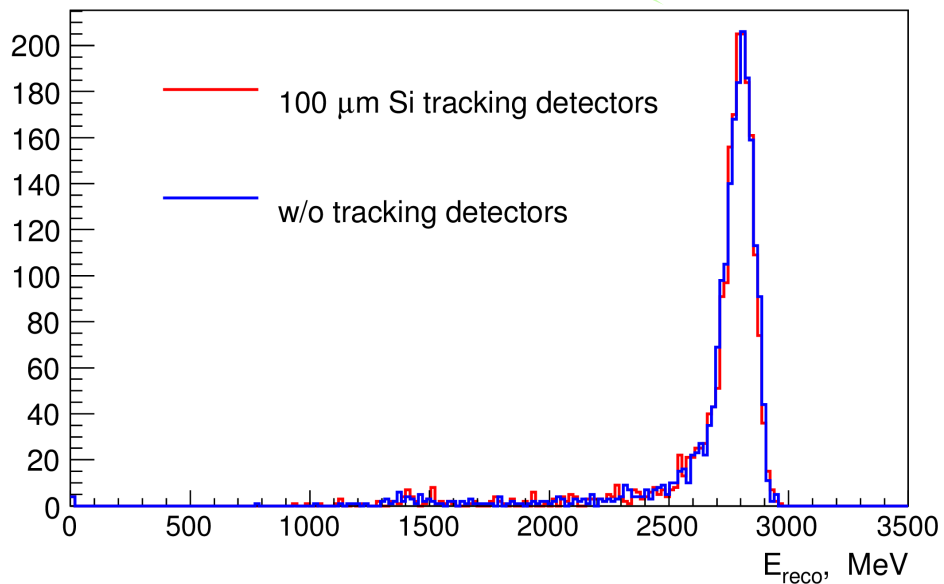
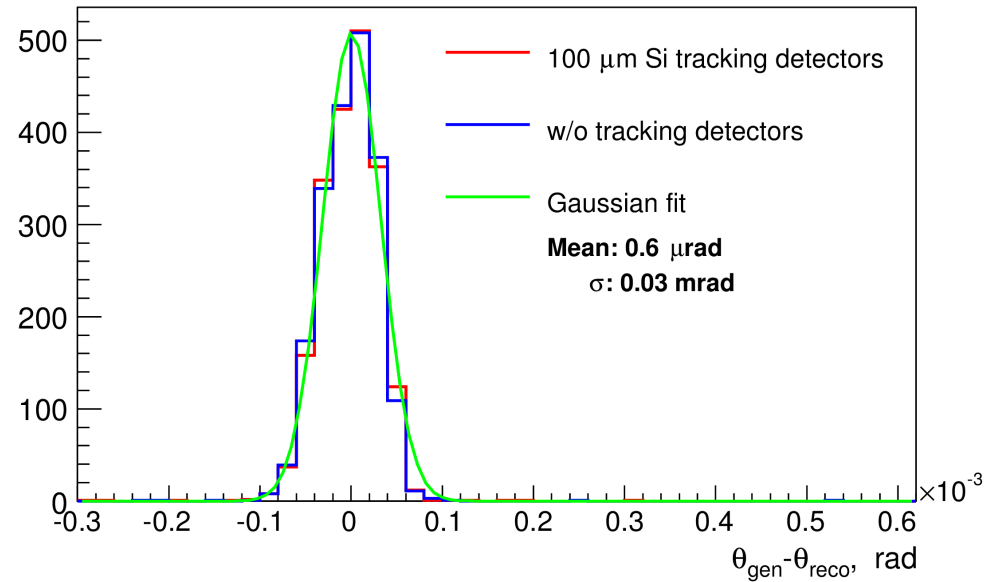
2 cases:

- without tracking detector (air);
- with 2 layer of 100 μm thick Si.

$\theta_{\text{gen}} - \theta_{\text{reco}}$;

$\phi_{\text{gen}} - \phi_{\text{reco}}$;

E_{reco} ;



Highlights of the new Implementation



- Geometry information can be read from Gear or soon DD4hep
- Several methods for including background
 - ▶ Individual background bunch crossings for most realism
 - ★ Bunch crossing is randomly picked from a set
 - ★ Processor to create suitable root files only containing BeamCal background included
 - ▶ Parametrisation of background (A. Saproinov)
 - ★ Suitable processor to create parametrisation also included
 - ▶ Averaged background (as in old implementation)
 - ★ Can read the `bg_aver...` files used for ILD reconstruction
- “Event Display” for understanding events in the BeamCal
- Write out efficiency histograms
- Steerable Marlin Processor
- To add new clustering you only have to write a new ‘doClustering’ function

How to Install



- Source code in FCAL svn repository:

`https://svnsrv.desy.de/svn/FCAL/Software/FCalClusterer/`

- Standard installation (Needs Marlin, Icio, Gear, and Root)

```
svn co https://svnsrv.desy.de/public/FCAL/Software/FCalClusterer/trunk FCalCluster
cd FCalCluster
mkdir build
cd build
cmake -C $ILCSOFT/ILCSOft.cmake ..
make install
export MARLIN_DLL=...
```

- Will make a (pre)-release branch and tag soon

Summary

- LumiCal reconstruction to be update in FCAL svn repository.
- New BeamCal reconstruction implementation is usable in ILD reconstruction
- BeamCal reconstruction needs tuning