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AraCluster Event Display

This page contains information about the ARA Cluster Event Display

Introduction

This page aims to provide useful information how to run the ARA Cluster Event Display.

Some specific sections have been included and it's properly indicated in the titles in used.

Code Repository: Checking out, compiling and running.

Check the SVN site.

In this section we'll check out the AthenaROOTAccessExamples package, compile and run it.

Checking out and compiling

This code is tested with Atlas Release 17.0.6.2.1
1. Prerequisites:
Setting your workarea:

```
export ATLAS_LOCAL_ROOT_BASE=/cvmfs/atlas.cern.ch/repo/ATLASLocalRootBase
alias setupATLAS='source ${ATLAS_LOCAL_ROOT_BASE}/user/atlasLocalSetup.sh'
setupATLAS
mkdir araced
cd araced
asetup 17.0.6.2.1,here,AtlasPhysics
```

(Remind: if are on SLC6 machine add slc5 to asetup option)

You need CaloTPCnv package in order to include Calibration Hits class inside ARA:
(starting from release 18 this will be not needed anymore)

```
cmt co -r CaloTPCnv-00-01-07 Calorimeter/CaloCnv/CaloTPCnv
cd Calorimeter/CaloCnv/CaloTPCnv/cmt
cmt config
cmt make
cmt do post_build_tpcnvdb
```

2. Check out the package and compile:

```
cd $TestArea
cmt co -r AthenaROOTAccessExamples-00-00-35 PhysicsAnalysis/AthenaROOTAccessExamples
cd PhysicsAnalysis/AthenaROOTAccessExamples/cmt
cmt config
cmt make
```

If the compilation goes well you'll move to next funny section --> RUN IT.

Running the event display: An example.

Go inside python directory:

```
cd PhysicsAnalysis/AthenaROOTAccessExamples/python
```

and copy this python file:

```
cp /afs/cern.ch/work/m/mcasolin/public/LC/example.py .
```

(it is also attached at this page example.py.txt)
Try to run it typing:

```
athena -i example.py
```

It will print on screen EM calorimeter clusters for one event inside an ESD. Type:

```
Ctrl+d to exit from Athena.
```

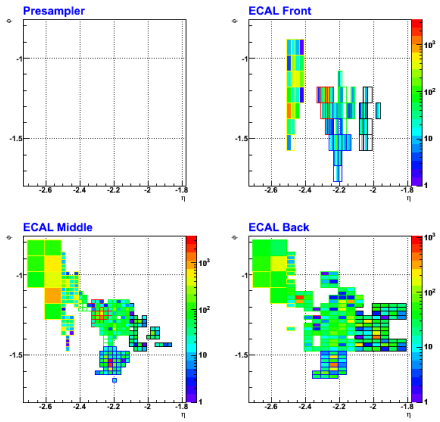
Description of Cluster Event Display classes

In this section we'll understand better the functionality of each class included in this Cluster Event Display.
There are 4 classes belonging to different part of Atlas Calorimeter:

- 3 for LAr Calorimeter: EM, HEC, FCal.
- 1 for Tile Calorimeter.

These classes have one method that plots cells inside clusters with correct geometry.
(An example to instantiate all classes checkESDWithGeometry.py.txt)
In each sub-section will be reported the method. There are also links at .h and .cxx.

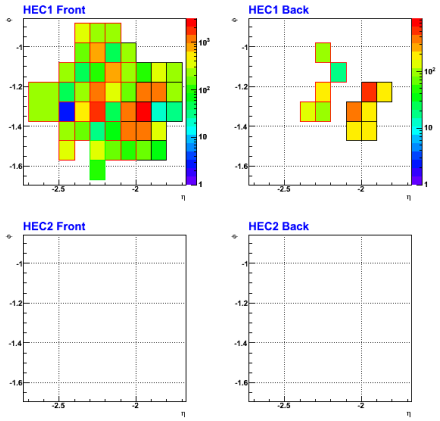
- Event display for EM calorimeter:




```
plot(TTree *theTree, int iEvent, bool storeCalibrationHits,bool doRatio=false, bool plotClusters=
```

Plot EMplanarESD.cxx
Plot EMplanarESD.h

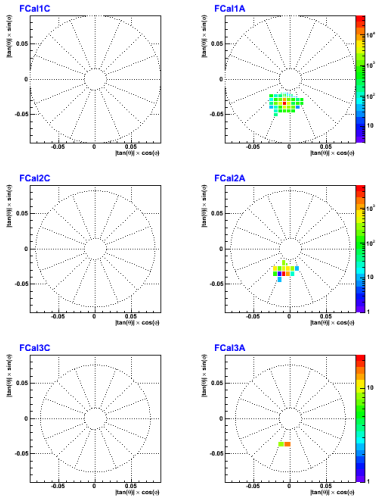
- Event display for HEC calorimeter:




```
plot(TTree *theTree, int iEvent, bool storeCalibrationHits,bool doRatio=false, bool plotClusters=
```

PlotHECplanarESD.cxx
PlotHECplanarESD.h

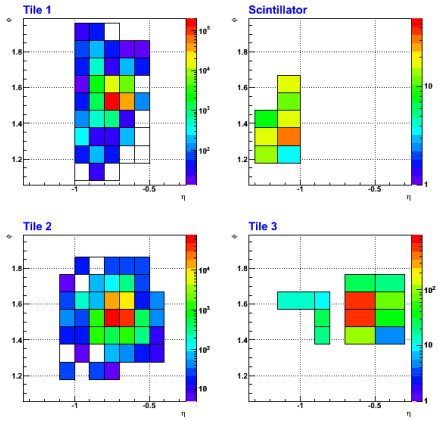
- Event display for FCal calorimeter:




```
plot(TTree *theTree, int iEvent,bool storeCalibrationHits,bool doRatio=false, bool plotClusters=t
```

PlotFCalESD.cxx
PlotFCalESD.h

- Event display for Tile calorimeter:




```
plot(TTree *theTree, int iEvent,bool storeCalibrationHits,bool doRatio=false, bool plotClusters=t
```

PlotTileplanarESD.cxx
PlotTileplanarESD.h

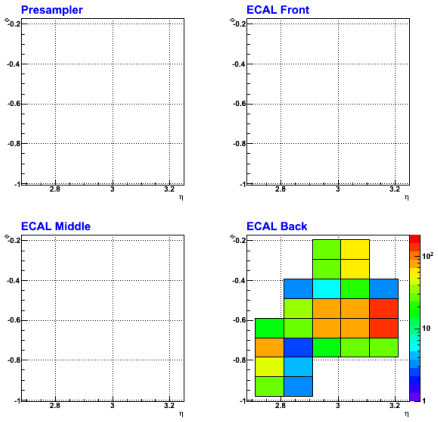
Options summary for each method:

- theTree: ARA transient tree to give to the class
- iEvent: number of event to show (if <0 it loop on all events inside the tree, it is not useful of you have Calibration Hits informations active)
- storeCalibrationHits: if it decides to show or not Calibration Hits informations.
- doRatio: if is false it shows Calibration Hit energy writing the number inside the cell, if is true it shows ratio between

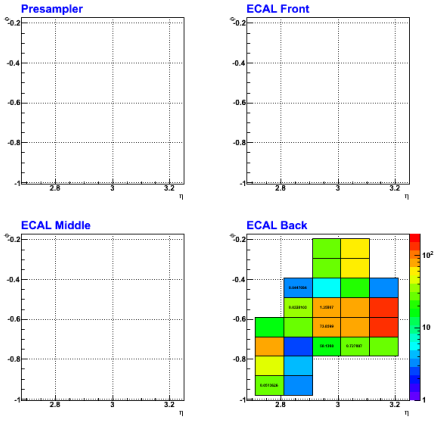
Calibration Hits energy and Cell energy
- plotCluster: if is true it draw a line that delimits the cluster.
- key: key SG name read inside the pool (default is CaloCalTopoCluster).
- clusEtMin: cut on cluster ET (default is 1 GeV)
- isEnergy: if true it shows color according cells energy, if false it shows only energy sign (Calibration Hits informations work only if true)
- cname: canvas name
- CalibrationHitsType: You can choose what kind of Calibration Hits you want to plot → All, Active, Inactive
- CalibrationHitsEnergy: You can choose what kind of Calibration Hits Energy you want to plot → Total, EM, NonEM, Visible, Escaped, Invisible

Calibration Hits infos

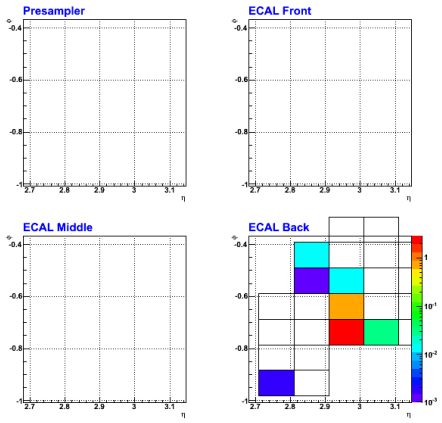
- Event display for EM calorimeter without CalibrationHits:



- Event display for EM calorimeter with CalibrationHits infos but without ratio mode:



- Event display for EM calorimeter with CalibrationHits infos in ratio mode:



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