Status of GCRCalib package - 10/07/2006

> code upgrade (see UML diagram) :

* Path length computation
* Expected deposited energy hard coded (stored in an array)
* Clustering and multiplicity computed for each layer
* Selection of useful logs : in a cluster <= 2 hits && energy>100 MeV && crossed by MC dir extrapolation
  => GCRSelectedXtalsTab (array written in merit.root through GCRSelectValsTool in AnalysisNTuple) : energy and path length

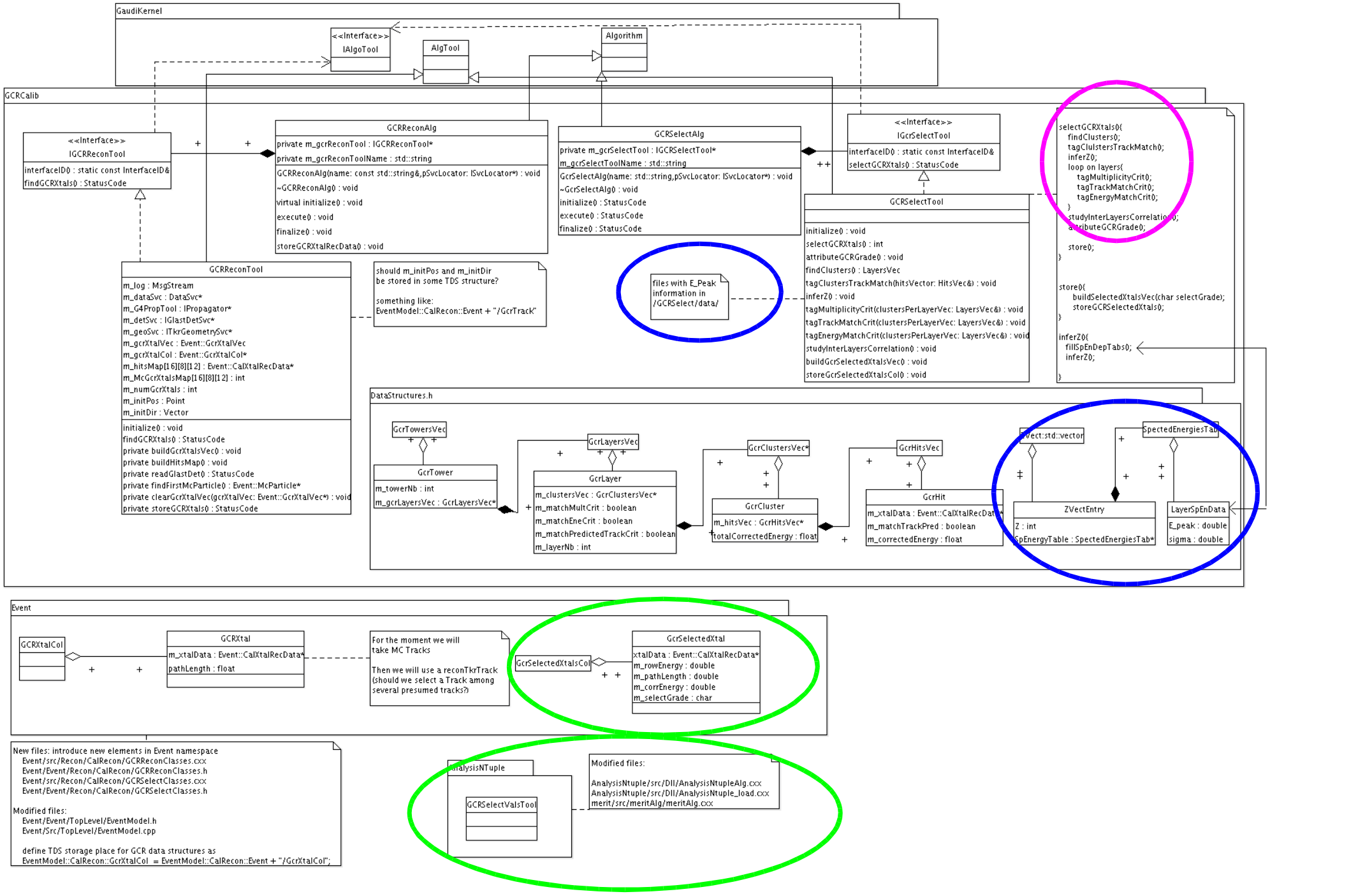
> GR (v9r3) installed and compiled at CC IN2P3 including GCRCalib package

> Heavy ions sources created (5 GeV/n):

```
FluxAlg.source_name="vertical_C_pencil";
FluxAlg.source_name="vertical_C";
FluxAlg.source_name="C_30deg";
FluxAlg.source_name="vertical_Si_pencil";
FluxAlg.source_name="vertical_Si";
FluxAlg.source_name="Si_30deg";
```

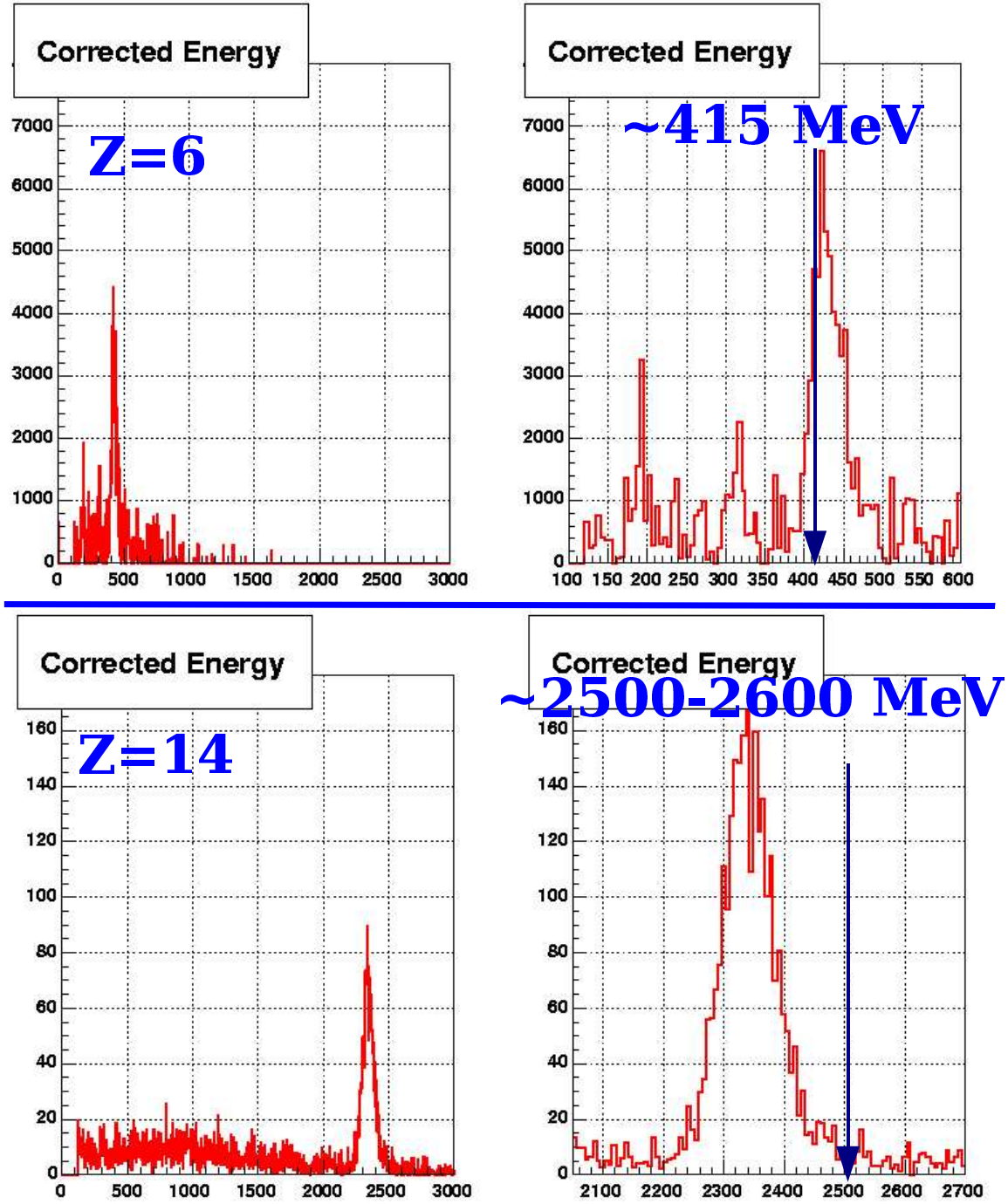
> First batch runs (thanks Berrie and Thierry)

> First plots of deposited energy for vertical_C and vertical_Si


GaudiKernel
<<Interface>>
IAlgoTool
AlgTool
Algorithm
GCRCalib
<<Interface>>
IGCRReconTool
interfaceID() : static const InterfaceID&
findGCRXtals() : StatusCode
GCRReconAlg
private m_gcrReconTool : IGCRReconTool*
private m_gcrReconToolName : std::string
GCRReconAlg(name: const std::string&,pSvcLocator: ISvcLocator*) : void
~GCRReconAlg() : void
virtual initialize() : void
execute() : void
finalize() : void
storeGCRXtalRecData() : void
GCRSelectAlg
private m_gcrSelectTool : IGCRSelectTool*
m_gcrSelectToolName : std::string
GcrSelectAlg(name: std::string,pSvcLocator: ISvcLocator*) : void
~GcrSelectAlg() : void
initialize() : StatusCode
execute() : StatusCode
finalize() : StatusCode
<<Interface>>
IGcrSelectTool
interfaceID() : static const InterfaceID&
selectGCRXtals() : StatusCode
GCRSelectTool
initialize() : void
selectGCRXtals() : int
attributeGCRGrade() : void
findClusters() : LayersVec
tagClustersTrackMatch(hitsVector: HitsVec&) : void
inferZ() : void
tagMultiplicityCrit(clustersPerLayerVec: LayersVec&) : void
tagTrackMatchCrit(clustersPerLayerVec: LayersVec&) : void
tagEnergyMatchCrit(clustersPerLayerVec: LayersVec&) : void
studyInterLayersCorrelation() : void
buildGcrSelectedXtalsVec() : void
storeGcrSelectedXtalsCol() : void
selectGCRXtals(){
findClusters();
tagClulstersTrackMatch();
inferZ();
loop on layers{
tagMultiplicityCrit();
tagTrackMatchCrit();
tagEnergyMatchCrit();
}
studyInterLayersCorrelation();
attributeGCRGrade();
store();
}
store(){
buildSelectedXtalsVec(char selectGrade);
storeGCRSelectedXtals();
}
inferZ(){
fillSpEnDepTabs();
inferZ();
}
GCRReconTool
m_log : MsgStream
m_dataSvc : DataSvc*
m_G4PropTool : IPropagator*
m_detSvc : IGlastDetSvc*
m_geoSvc : ITkrGeometrySvc*
m_gcrXtalVec : Event::GcrXtalVec
m_gcrXtalCol : Event::GcrXtalCol*
m_hitsMap[16][8][12] : Event::CalXtalRecData*
m_McGcrXtalsMap[16][8][12] : int
m_numGcrXtals : int
m_initPos : Point
m_initDir : Vector
initialize() : void
findGCRXtals() : StatusCode
private buildGcrXtalsVec() : void
private buildHitsMap() : void
private readGlastDet() : StatusCode
private findFirstMcParticle() : Event::McParticle*
private clearGcrXtalVec(gcrXtalVec: Event::GcrXtalVec*) : void
private storeGCRXtals() : StatusCode
should m_initPos and m_initDir
be stored in some TDS structure?
something like:
EventModel::CalRecon::Event + "/GcrTrack"
files with E_Peak
information in
/GCRSelect/data/
DataStructures.h
GcrTowersVec
GcrTower
m_towerNb : int
m_gcrLayersVec : GcrLayersVec*
GcrLayersVec
GcrLayer
m_clustersVec : GcrClustersVec*
m_matchMultCrit : boolean
m_matchEneCrit : boolean
m_matchPredictedTrackCrit : boolean
m_layerNb : int
GcrClustersVec*
GcrCluster
m_hitsVec : GcrHitsVec*
totalCorrectedEnergy : float
GcrHitsVec
GcrHit
m_xtalData : Event::CalXtalRecData*
m_matchTrackPred : boolean
m_correctedEnergy : float
Vect:std::vector
SpectedEnergiesTab
ZVectEntry
Z : int
SpEnergyTable : SpectedEnergiesTab*
LayerSpEnData
E_peak : double
sigma : double
Event
GCRXtalCol
GCRXtal
m_xtalData : Event::CalXtalRecData*
pathLength : float
For the moment we will
take MC Tracks
Then we will use a reconTkrTrack
(should we select a Track among
several presumed tracks?)
GcrSelectedXtalsCol
GcrSelectedXtal
xtalData : Event::CalXtalRecData*
m_rowEnergy : double
m_pathLength : double
m_corrEnergy : double
m_selectGrade : char
New files: introduce new elements in Event namespace
Event/src/Recon/CalRecon/GCRReconClasses.cxx
Event/Event/Recon/CalRecon/GCRReconClasses.h
Event/src/Recon/CalRecon/GCRSelectClasses.cxx
Event/Event/Recon/CalRecon/GCRSelectClasses.h
Modified files:
Event/Event/TopLevel/EventModel.h
Event/Src/TopLevel/EventModel.cpp
define TDS storage place for GCR data structures as
EventModel::CalRecon::GcrXtalCol = EventModel::CalRecon::Event + "/GcrXtalCol";
AnalysisNTuple
GCRSelectValsTool
Modified files:
AnalysisNtuple/src/Dll/AnalysisNtupleAlg.cxx
AnalysisNtuple/src/Dll/AnalysisNtuple_load.cxx
merit/src/meritAlg/meritAlg.cxx

30000 evts
Source : vertical_C/Si

NB :
PathLength=CsIHeight



Conclusions

> X_30deg sources : error in GCRRecon Alg (after a few events) maybe due to G4 propagator -> need for event scanning with Fred

> Remaining tasks :

- **GCRRecon**

  Add outputs to recon.root (already in TDS)

- **GCRSelect**

  *** complete filtering algorithm :**
  infer Z + matching between layers +
  event grade attribution (no glancing hits etc ...)

  *** add outputs to GCRSelect.root**