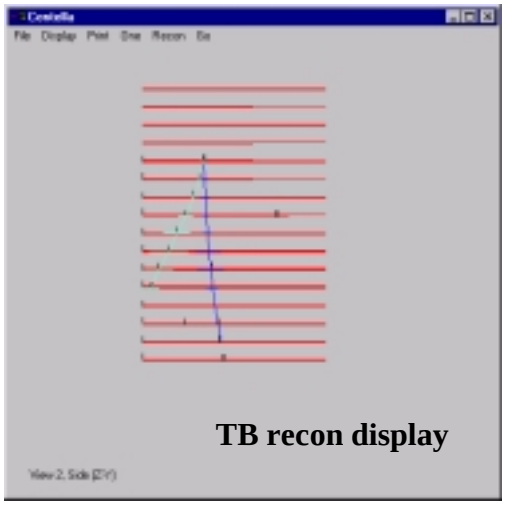
Tb Recon - Centella

Software workshop, May 15-17th, 2000

tb_recon - *Centella*

A Reconstruction Program for the 99/00 GLAST Test Beam



TB recon display

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U. California, Santa Cruz

TB RECON

- Analysis flow Data of the test Beam
- TB Recon - Structure
- TB Recon - Flow
- TB Recon - Documentation
- TB Recon - Status
- TB Algorithm - Calorimeter
  - Tracker

Quick look at the Data

- electrons 2-5 GeV
  - tracker and calorimeter rec
- gamma 2-15 GeV

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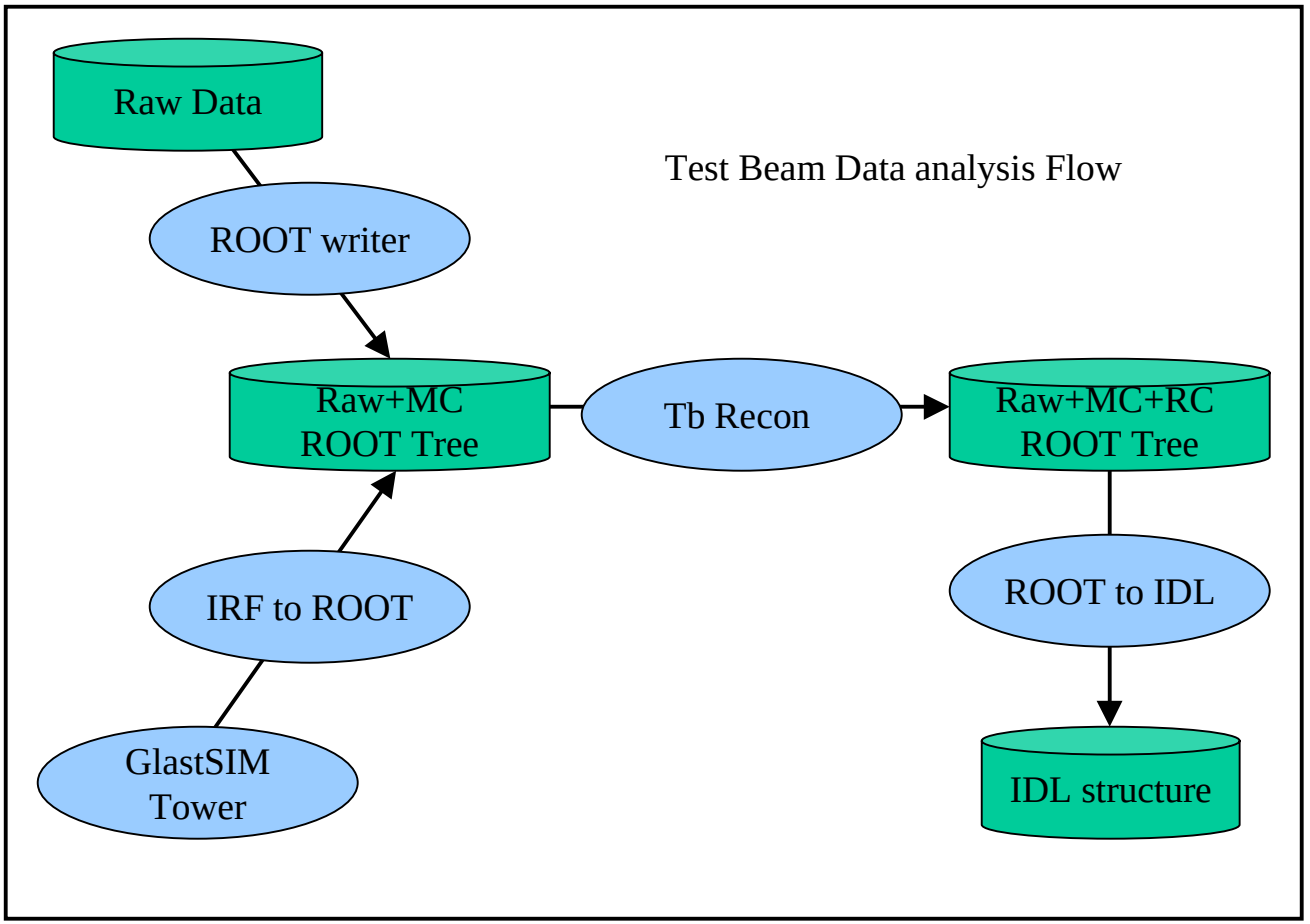
TB data analysis flow

Main Points:

- **Use of GLASTsim - tower to generate MC**
- **Convert Raw data to ROOT Trees**
- **Common MC, and Data Raw format**
- **Reconstruction runs on both MC/Data**
- **Persistent data: ROOT Ttree**

  Raw-MC-Rec branches



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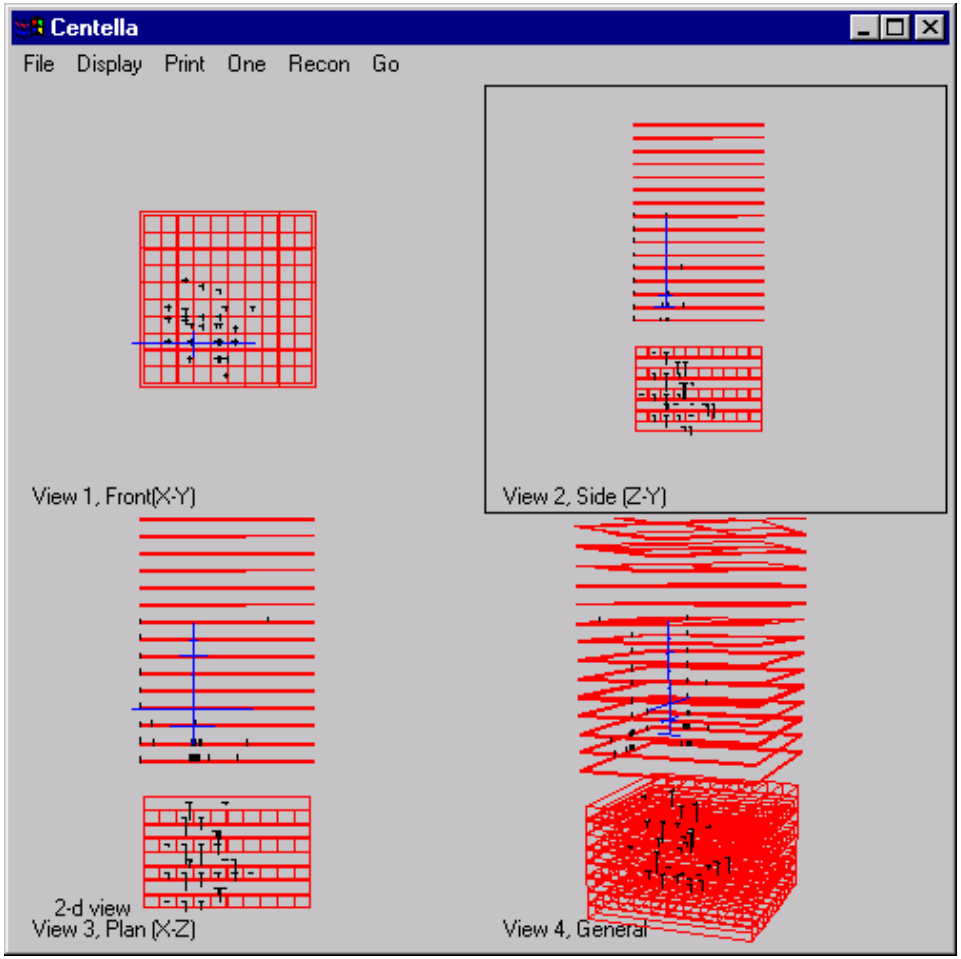
- **TBRecon - Purposes:**
  - Perform a full reconstruction
  - Can be use to particular detector studies
- **It inheretes from GLASTSIM**
  - Win display 3D
  - We use the GLASTsim Tracking Reconstruction
- **It Follows Gaudi's philosophy**
  - It Separate Data/Algorithm
  - It Separate Data in persistent (ROOT)-transient.
  - It provides servises: Option, message, and selection



Event Display: a high energy Gamma conversion, run 300

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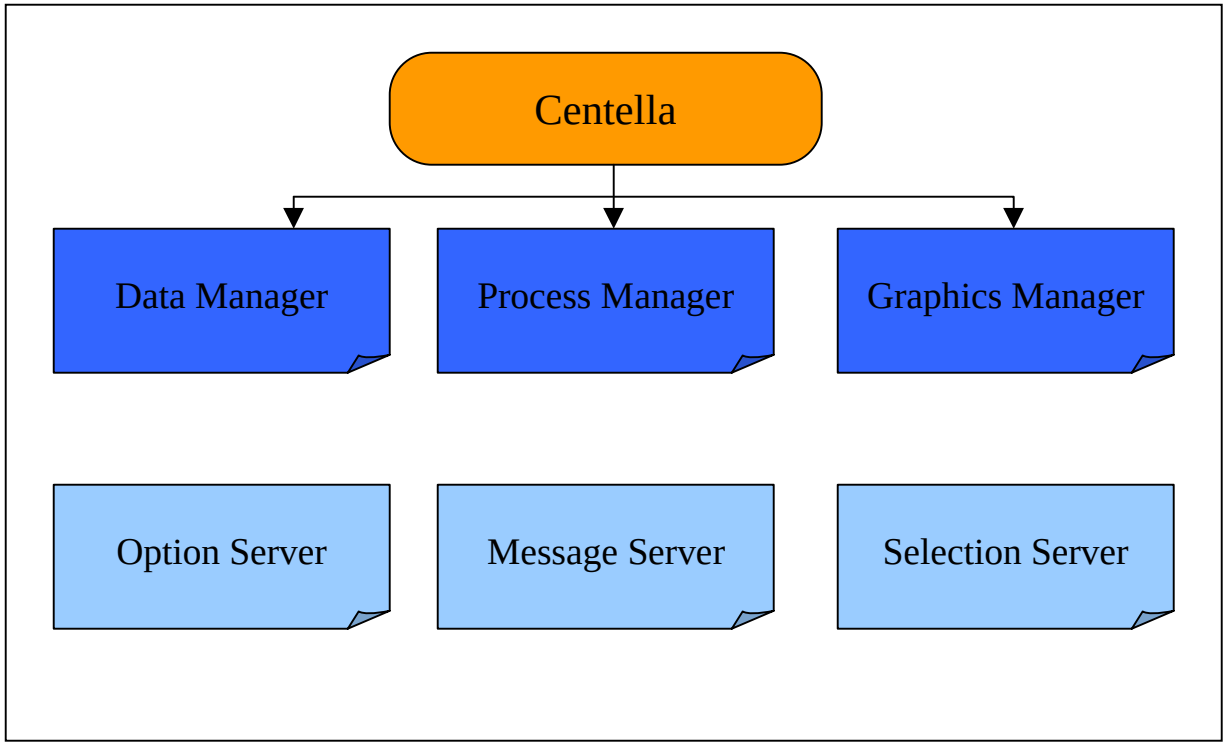
Tb_recon - structure

Application: **Centella**

- Data Manager
- Process Manager

  List of Algorithms
- Graphics Manager

  Optional



Services available

- Option Server

  (set option by the user)
- Message Server

  (print debug, info,etc)
- Selection Server

  (apply selection criteria)

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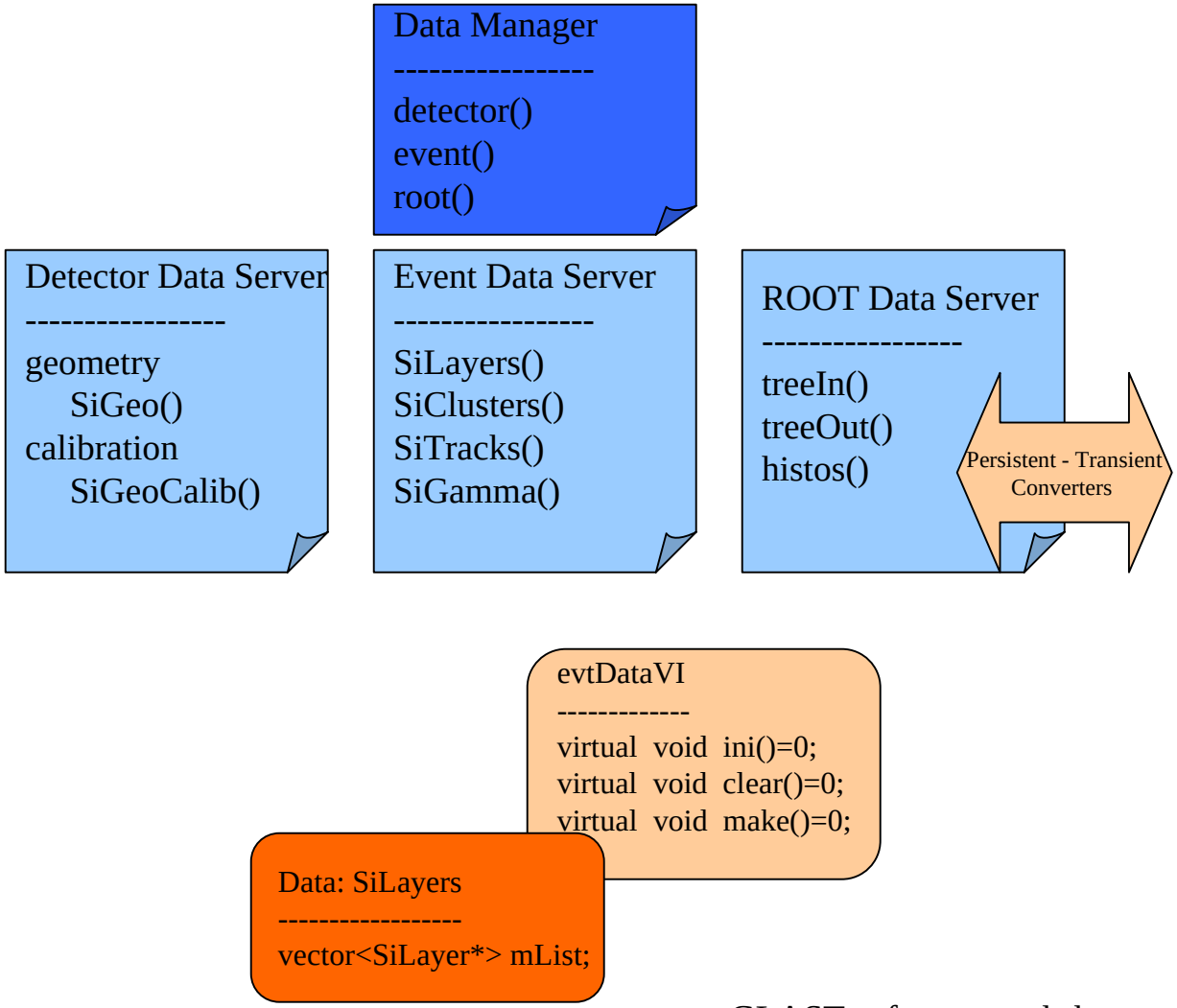
Tb_recon - Data Manager

Data Manager

- **Persistent Data**
  - Root Trees (I/0)
  - histograms (0)
- **Transient Data**
  - **Run Data**
    - geometry
    - calibration
  - **Event Data**
    - generation
    - reconstruction
    - analysis
- Transient Data inherits from
  - **evtDataVI** (virtual)



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Tb_recon - Data Manager

Process Manager

- **Event Processes**

  A event Process has

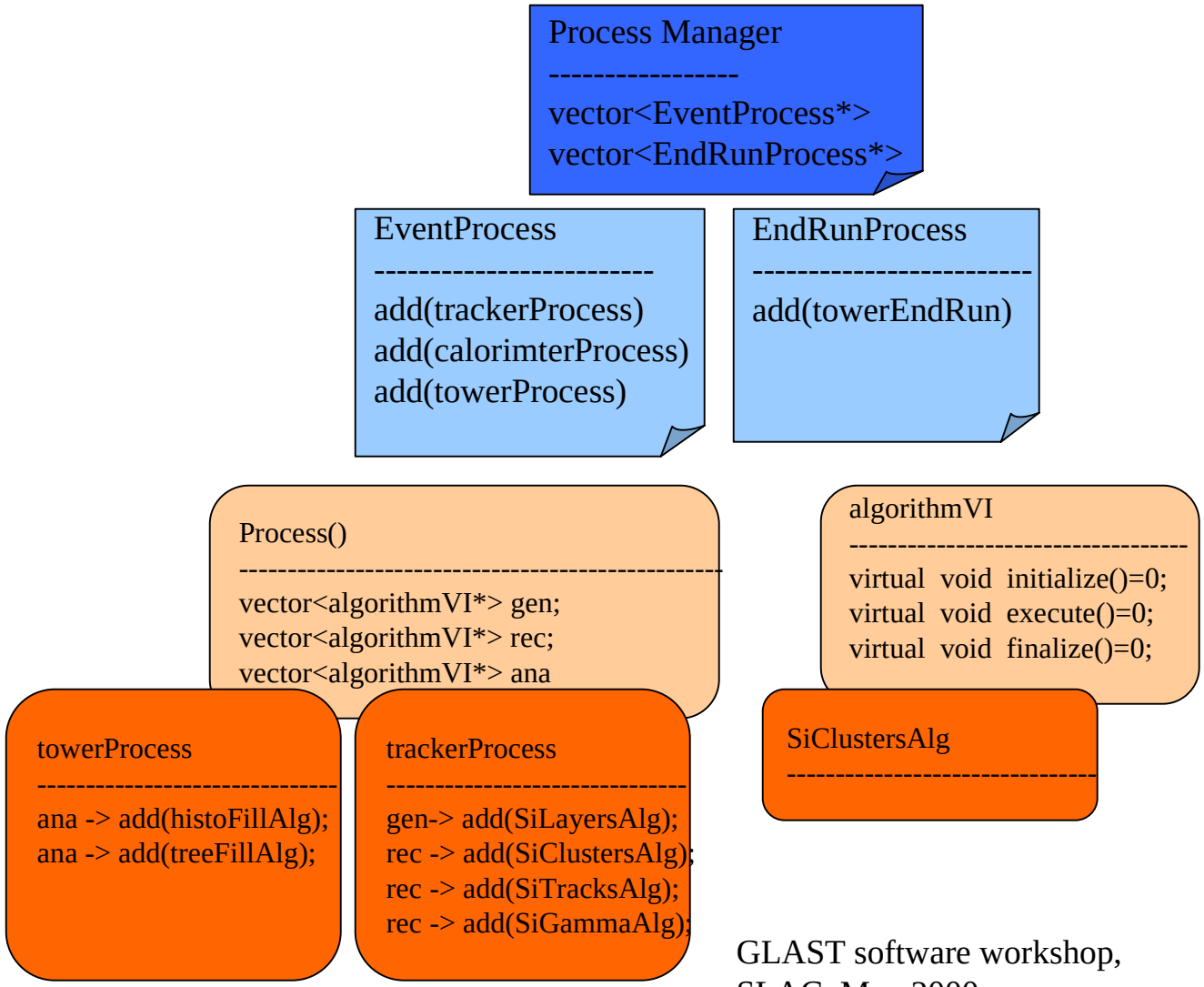
  - generation
  - reconstruction
  - analysis

  algorithms

- **End of Run Process**

  A list of algorithms

- All algorithm inherits from
  - **algorithmVI**



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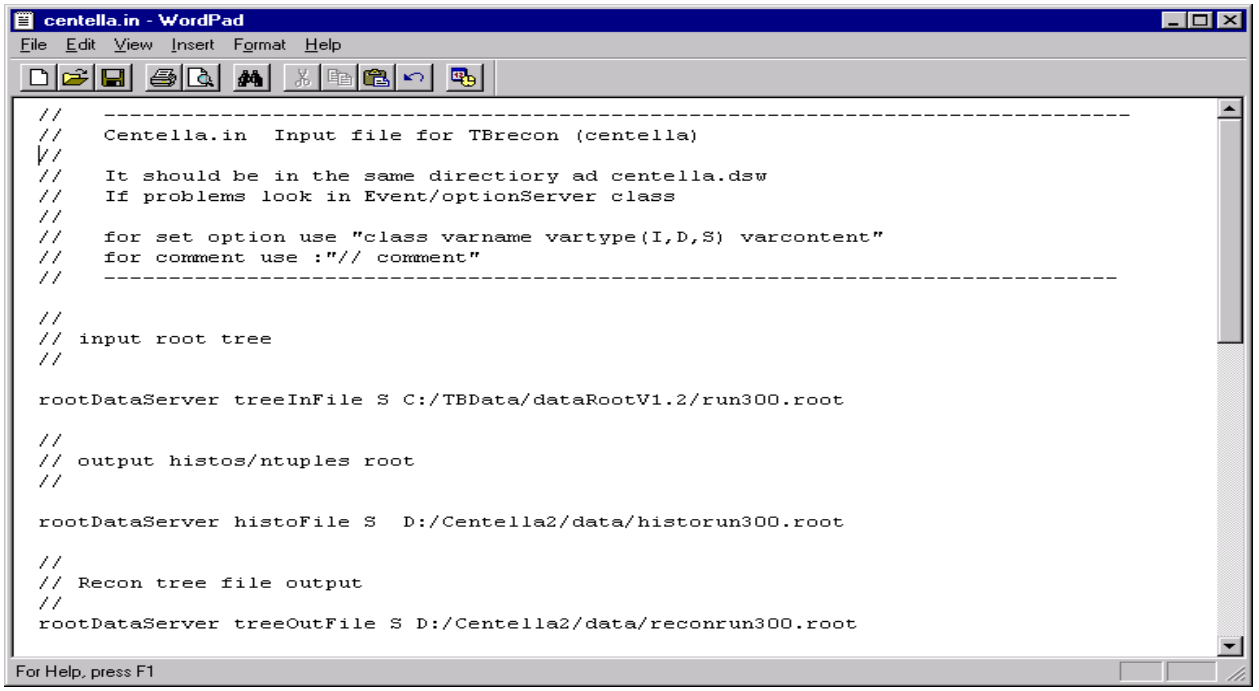
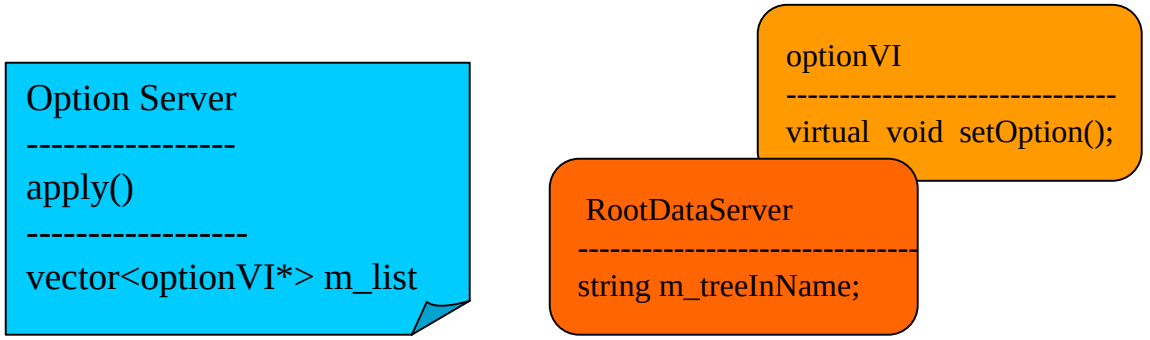
Tb_recon - Data Manager

Option Server

- Classes inherit from
  - optionVI
- Input file **centella.in**



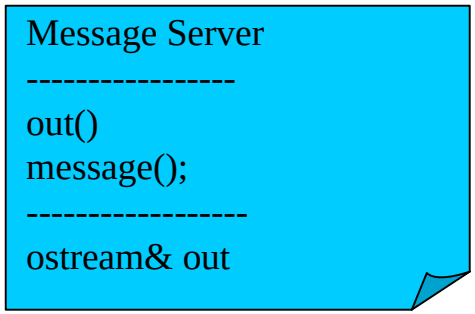


Tb Recon - Centella

Tb_recon - Data Manager

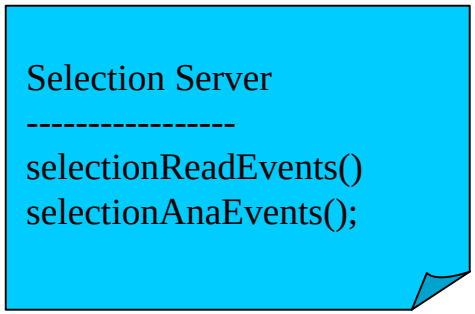
Message Server

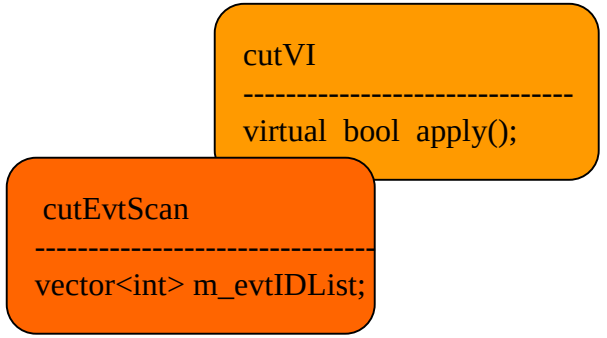
- Classes inherit from
  - **optionVI**
- Input file **centella.in**



Selection Server

- **classes inherit from**
  - **cutVI**





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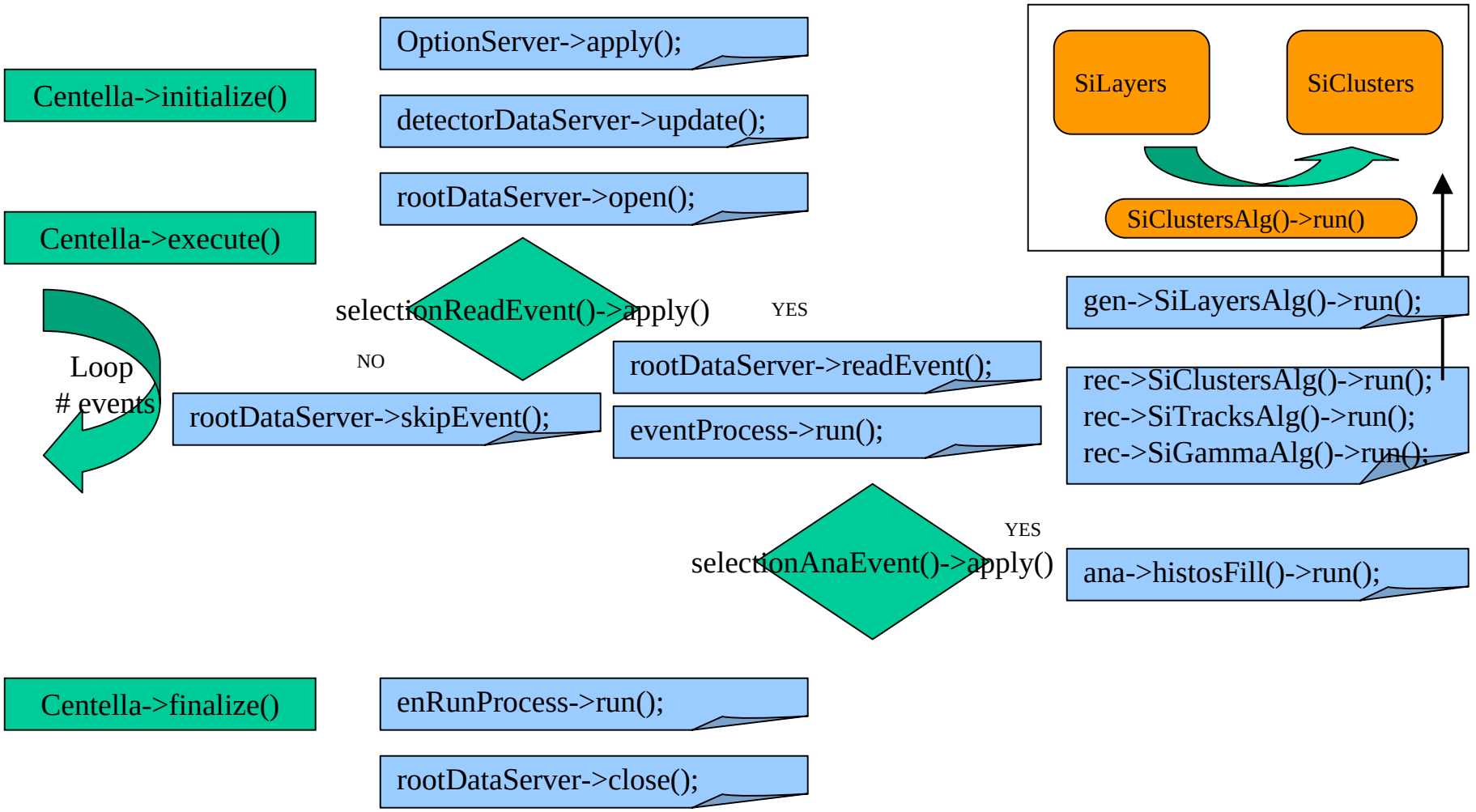
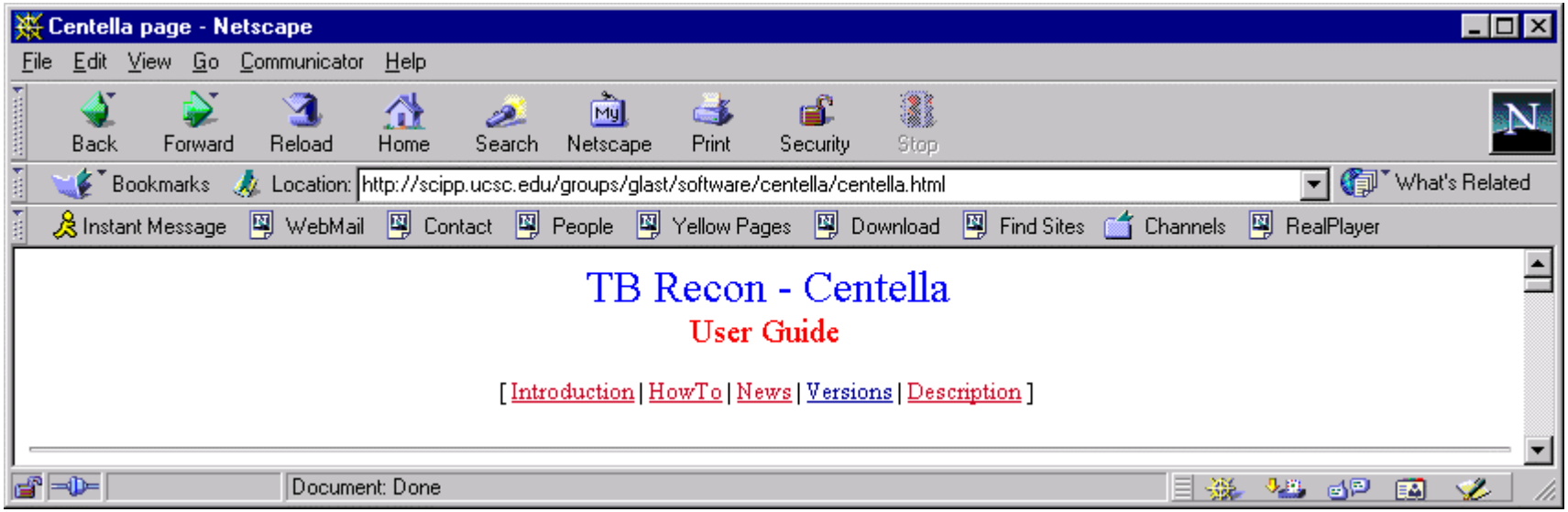
Tb_recon - Flaw



Tb Recon - Centella

Tb_recon - Documentation



tb_recon is under CVS : checkout “ib_recon”

documentaion: centella.html file in

where?

- CVS: under /tb_recon/documents
- or http://scipp.ucsc.edu/groups/glast/software/centella.html

who?

- Everyone can enter information in the centella.html file and commit to CVS

Tb Recon - Centella

Tb_recon - Status 05/16/00

Reconstruction code

- Tracking reconstruction working
  - Final validation needed
  - code extrapolator class?
- Naïve implementation of the calorimeter reconstruction
  - Ecole de France is taking the responsibility
- No interaction tracker/calorimeter implemented

ROOT I/O

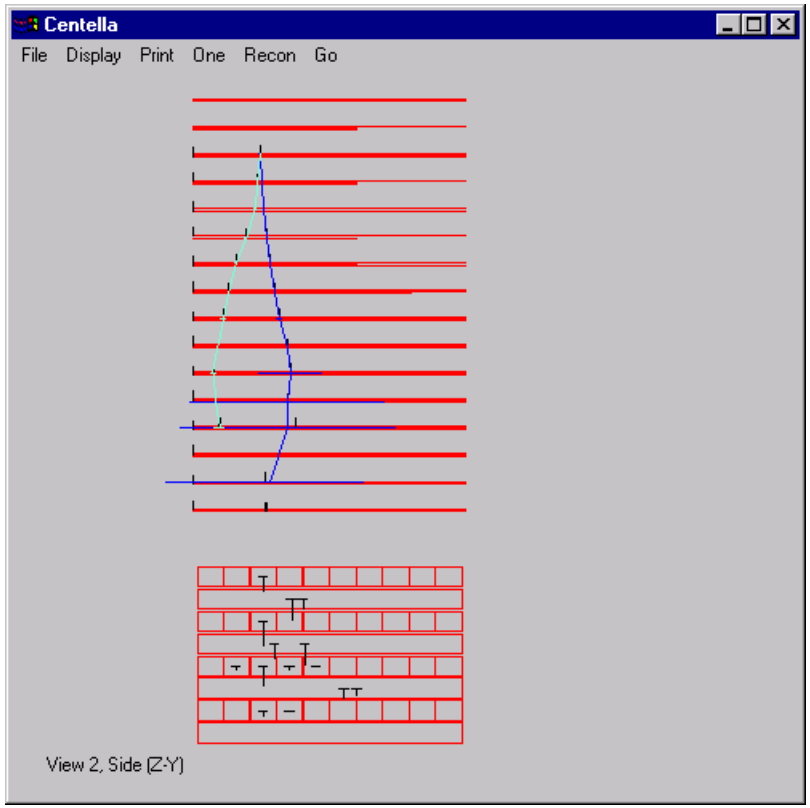
- Reading V1.2 root-tree version
- writing the output of the Recon Tree (Heather-Jose)

Portability

- Built tagged B110500 - compiles and runs in winNT
- Regis is trying to compile tb_recon under Unix/Linux

Graphics

- Simple winGUI to debug events



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Tb_recon - Algorithms

Tracker Reconstruction

GLASTsim tracker reconstruction

Pattern Recognition

- Search for
  - a) gamma V-signa
  - b) 5 More tracks
- Method:
  - Use Cal info: centroid and energy
  - Loop in all hits
  - Select X-Y candidates
  - Select 3D candidates

Track Fitting: Kalman Filter

Further Work

- Final validation
- Extrapolate tracks to cal

Calorimeter Reconstruction

Naïve reconstruction

- Berrie's pedestals for calibration
- Selection of the lowest range not saturated
  - EneLog = gain* (ADC-ped);
- Linear asymmetry to compute the position

Further Work

- Include linear coeficients for range-log (HEX)
- Include table of position for the asymmetry.
- Complications due:
  - LEX range - elec crosstalk
  - light lost in 32 diodes Simple.

Calorimeter+Tracking :

Further Work

- Better definition of energy to starts tracks

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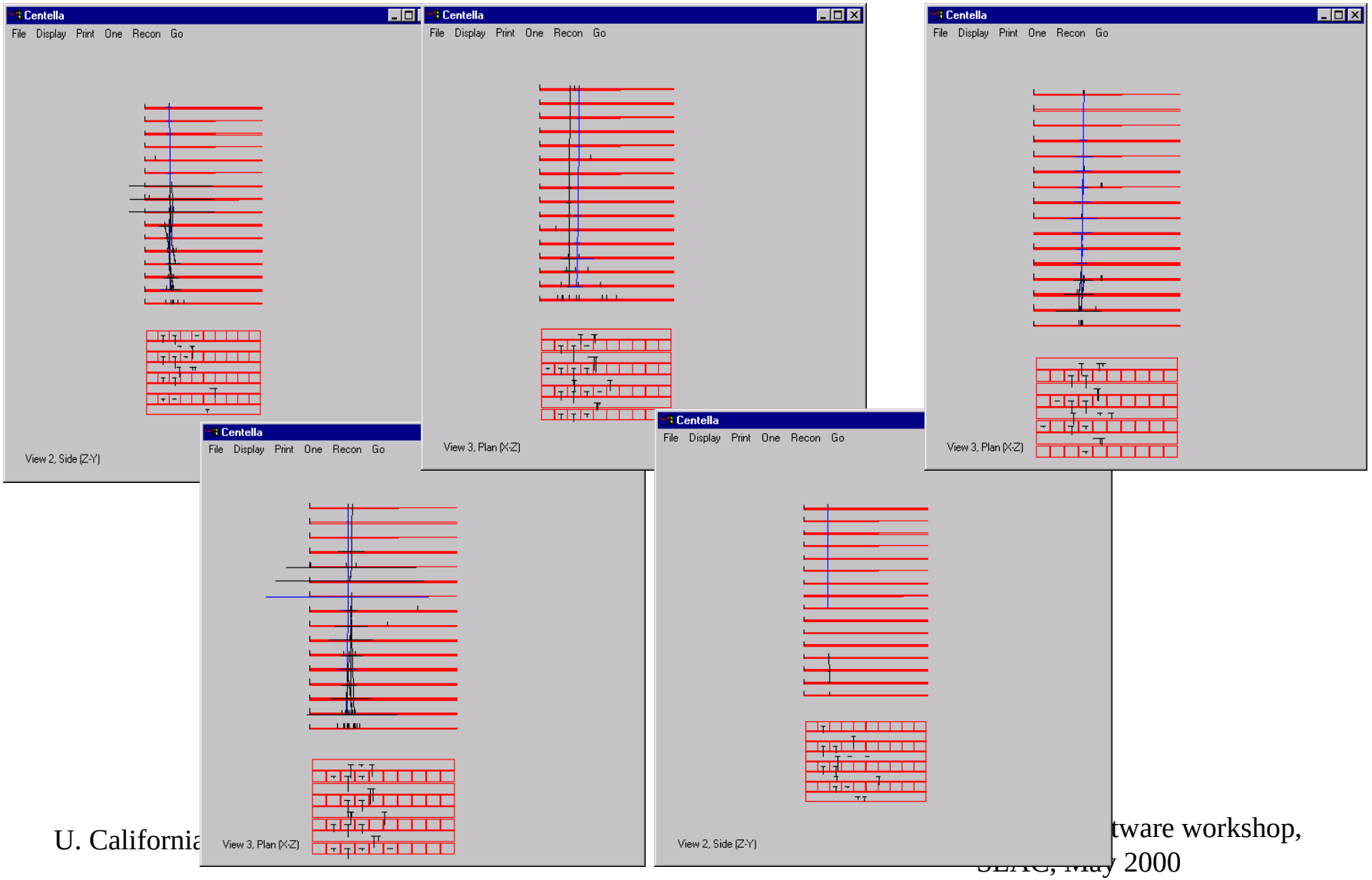

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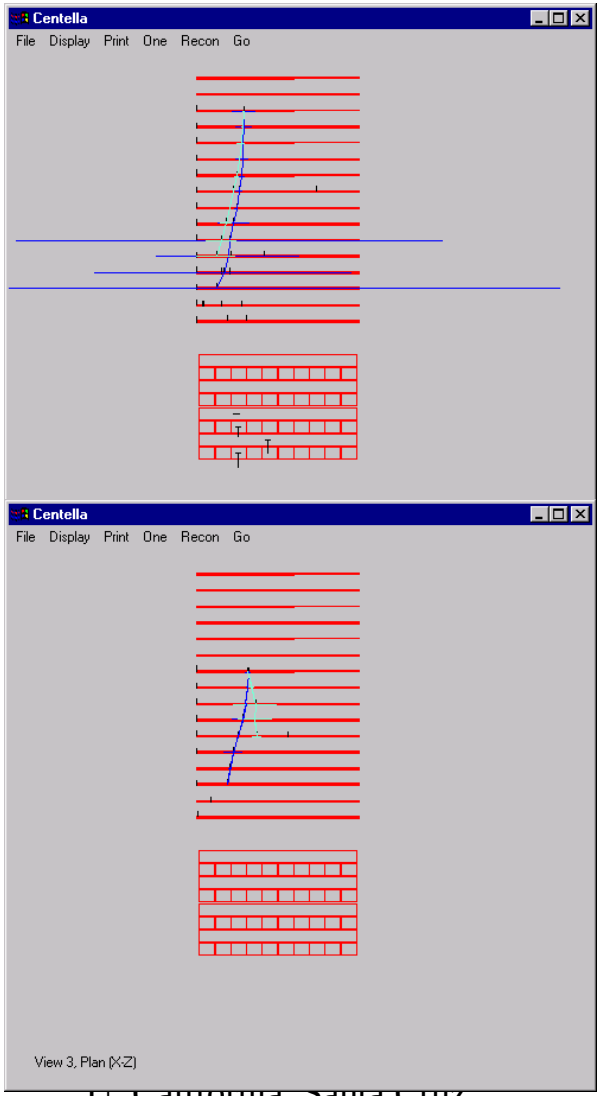

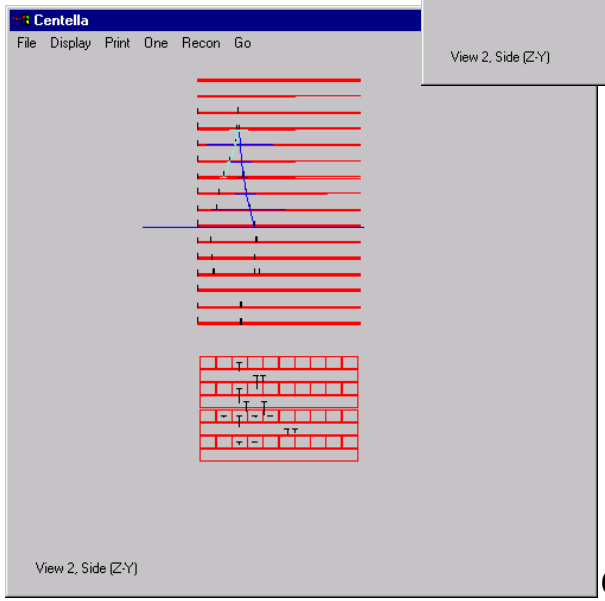

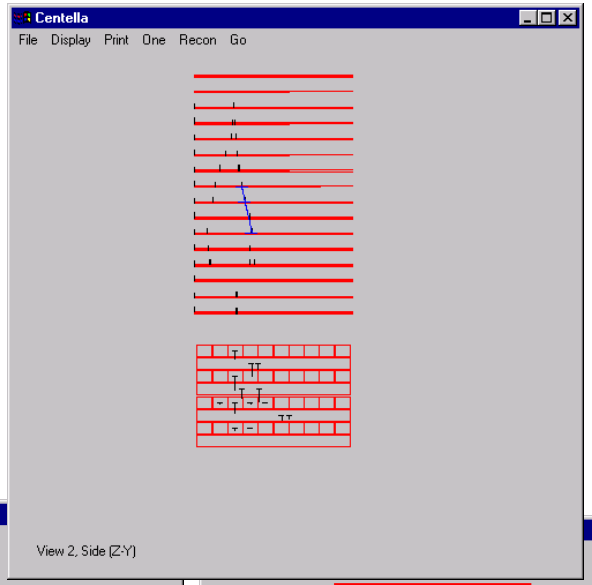

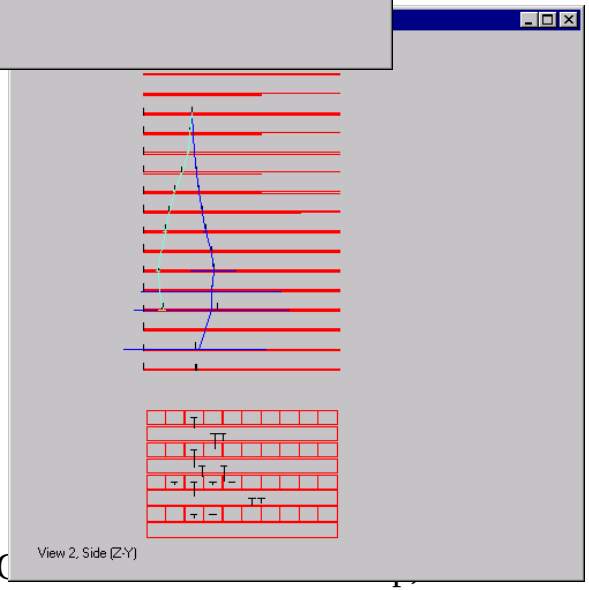

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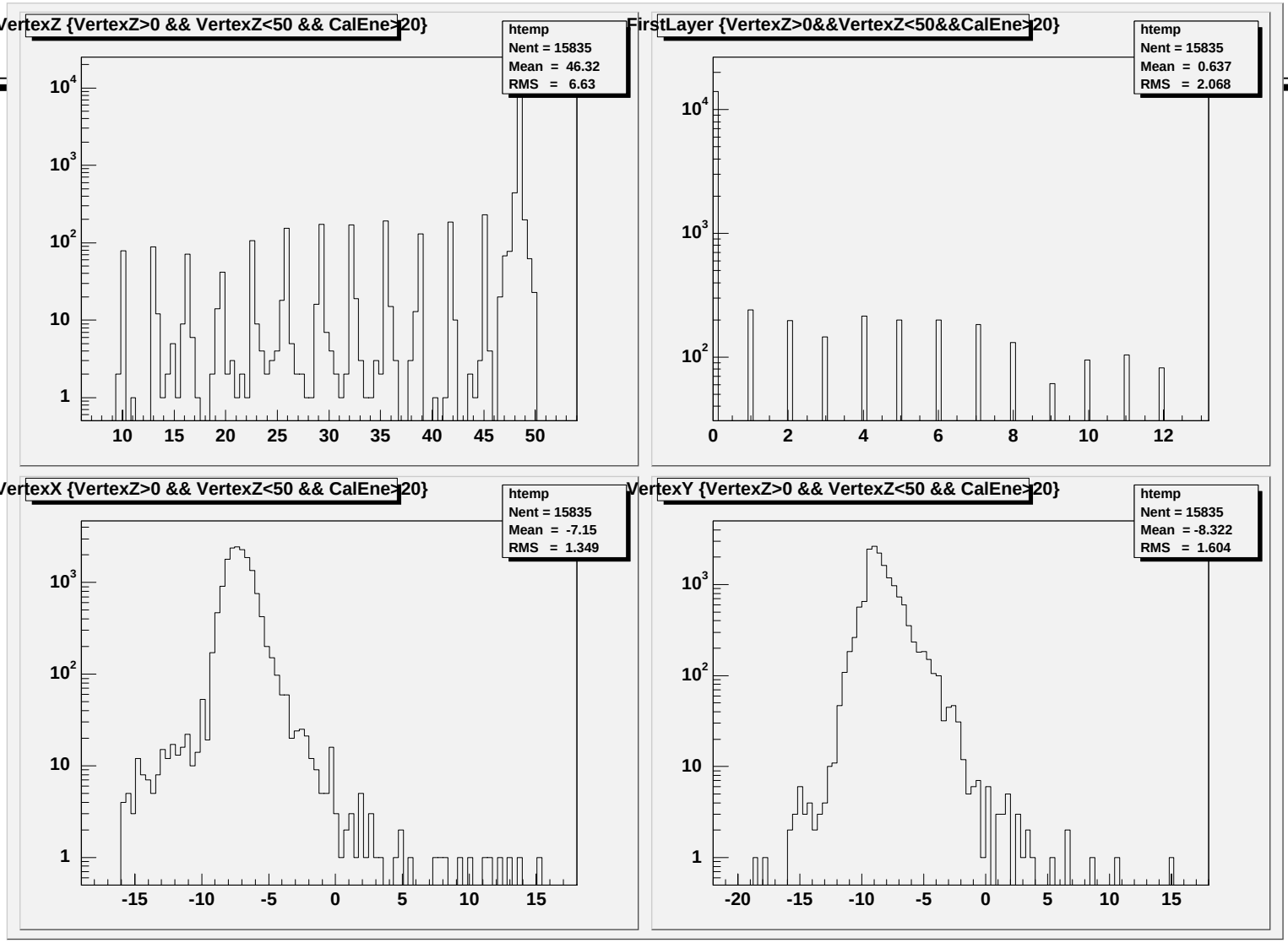

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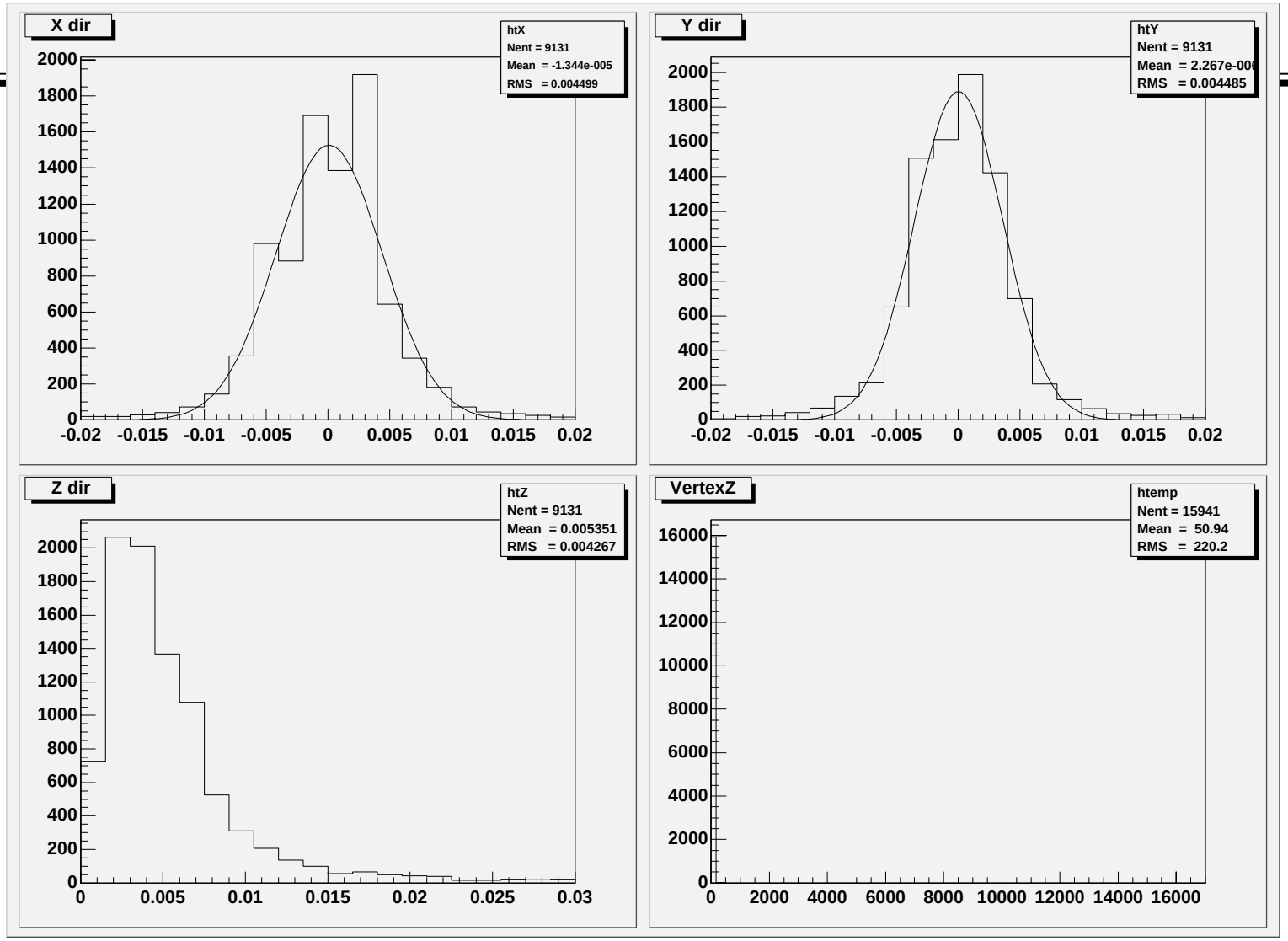

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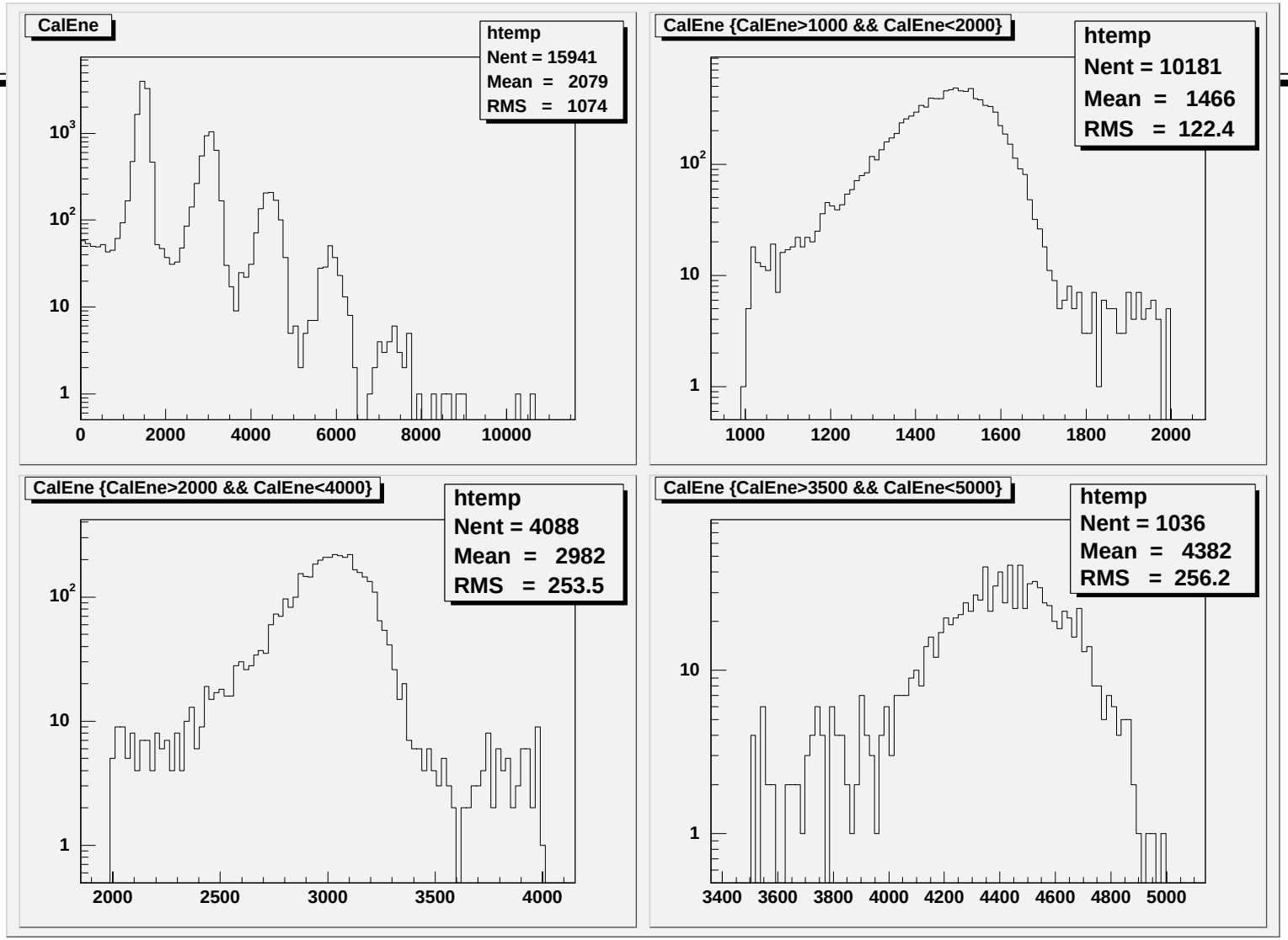

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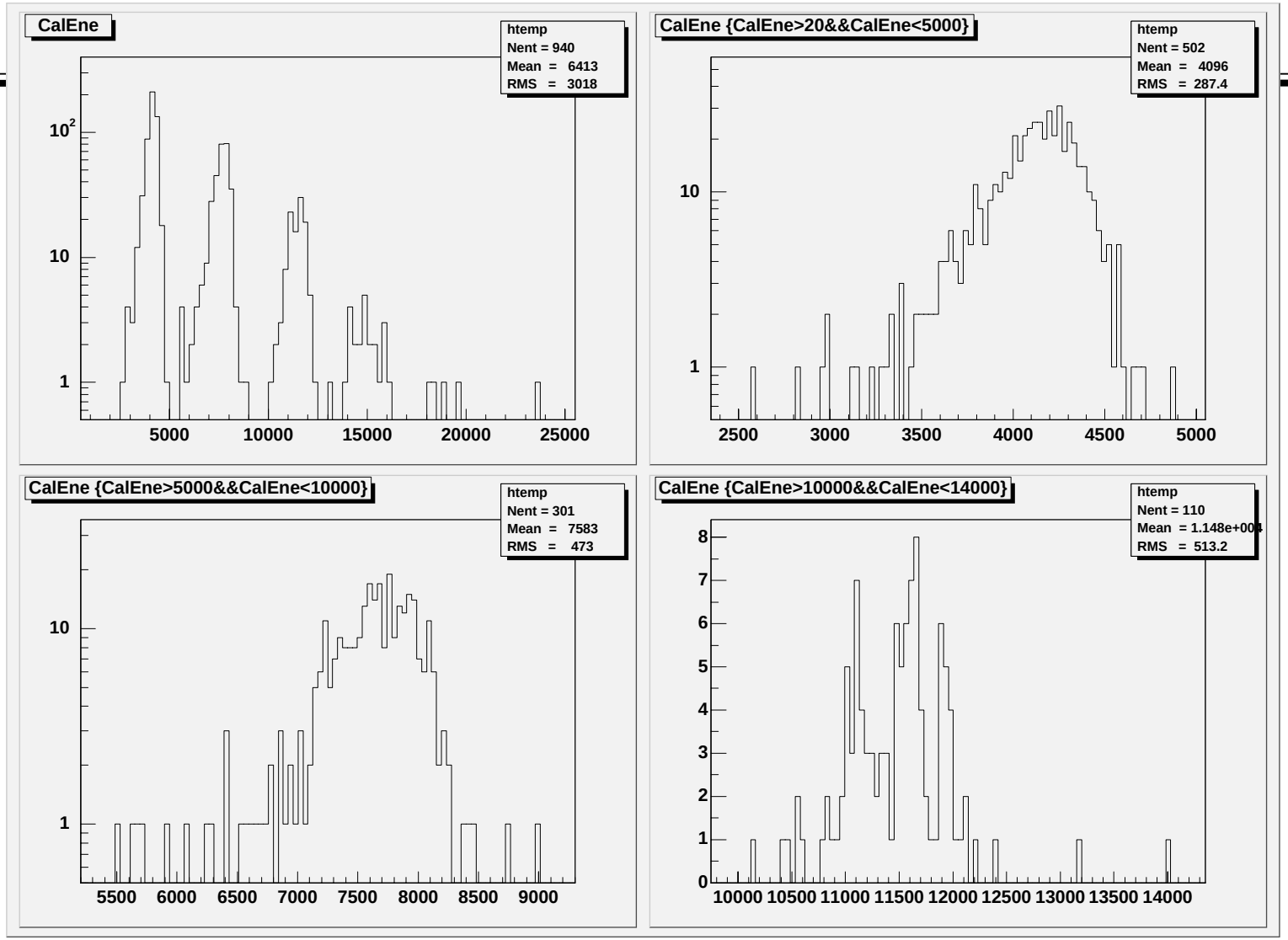

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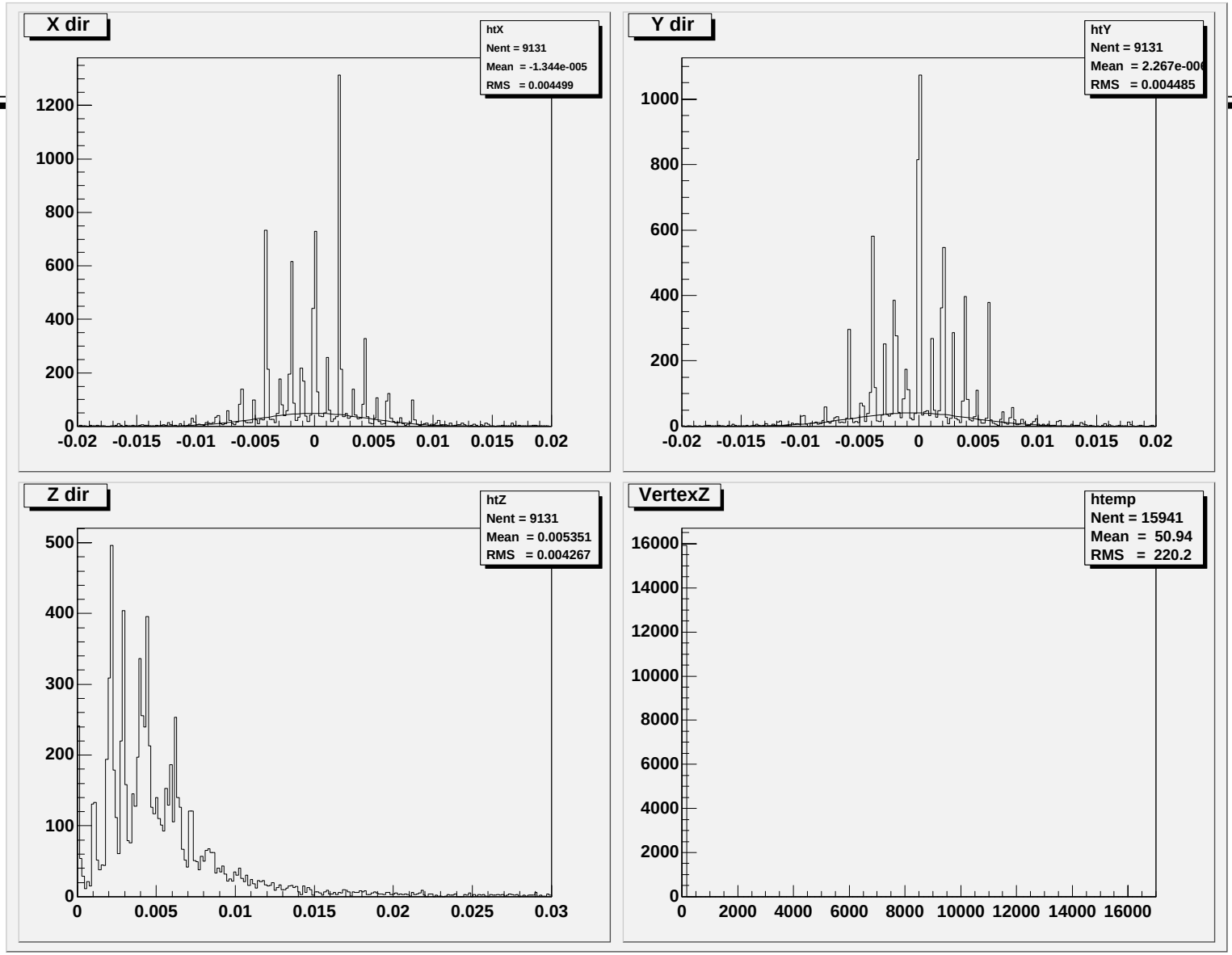

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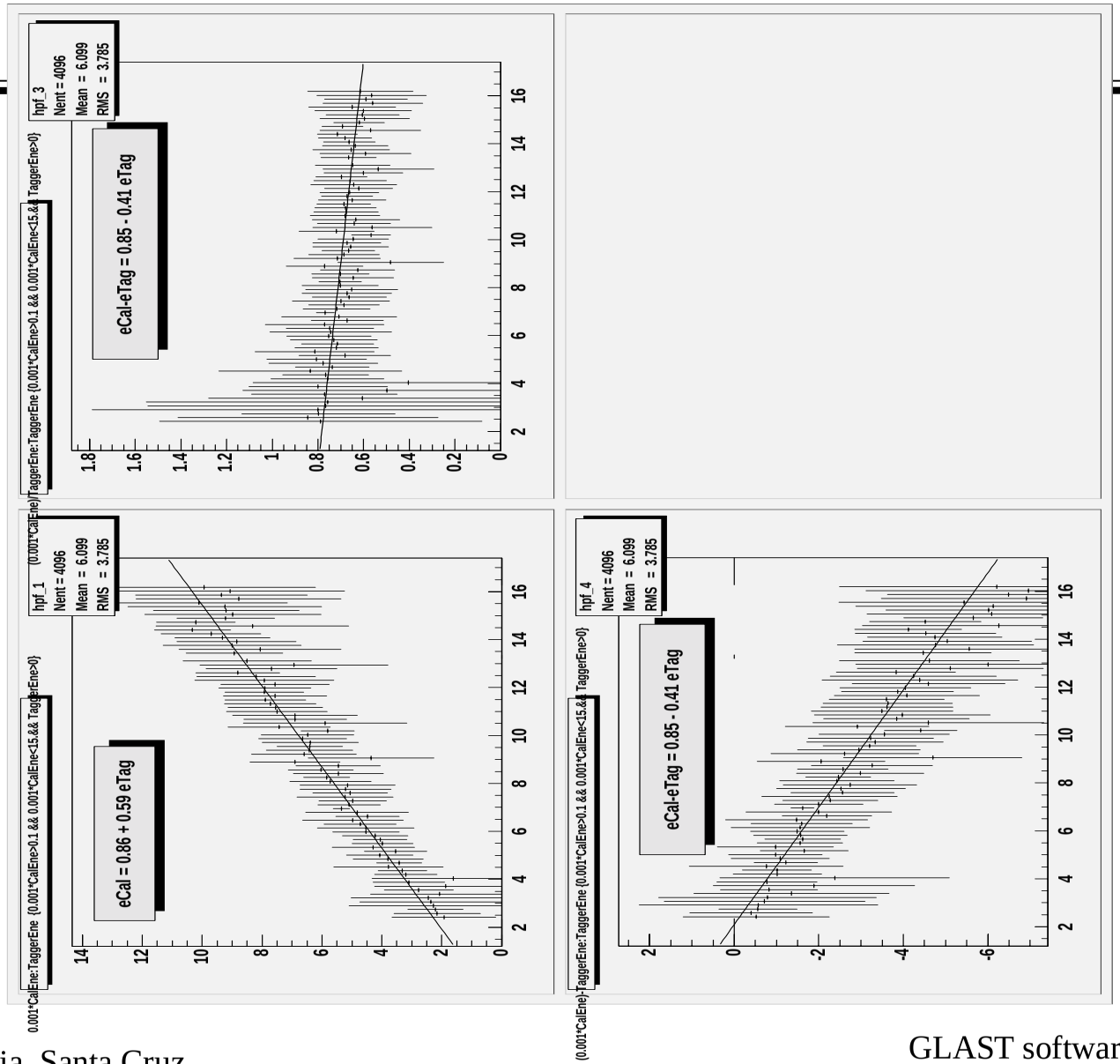

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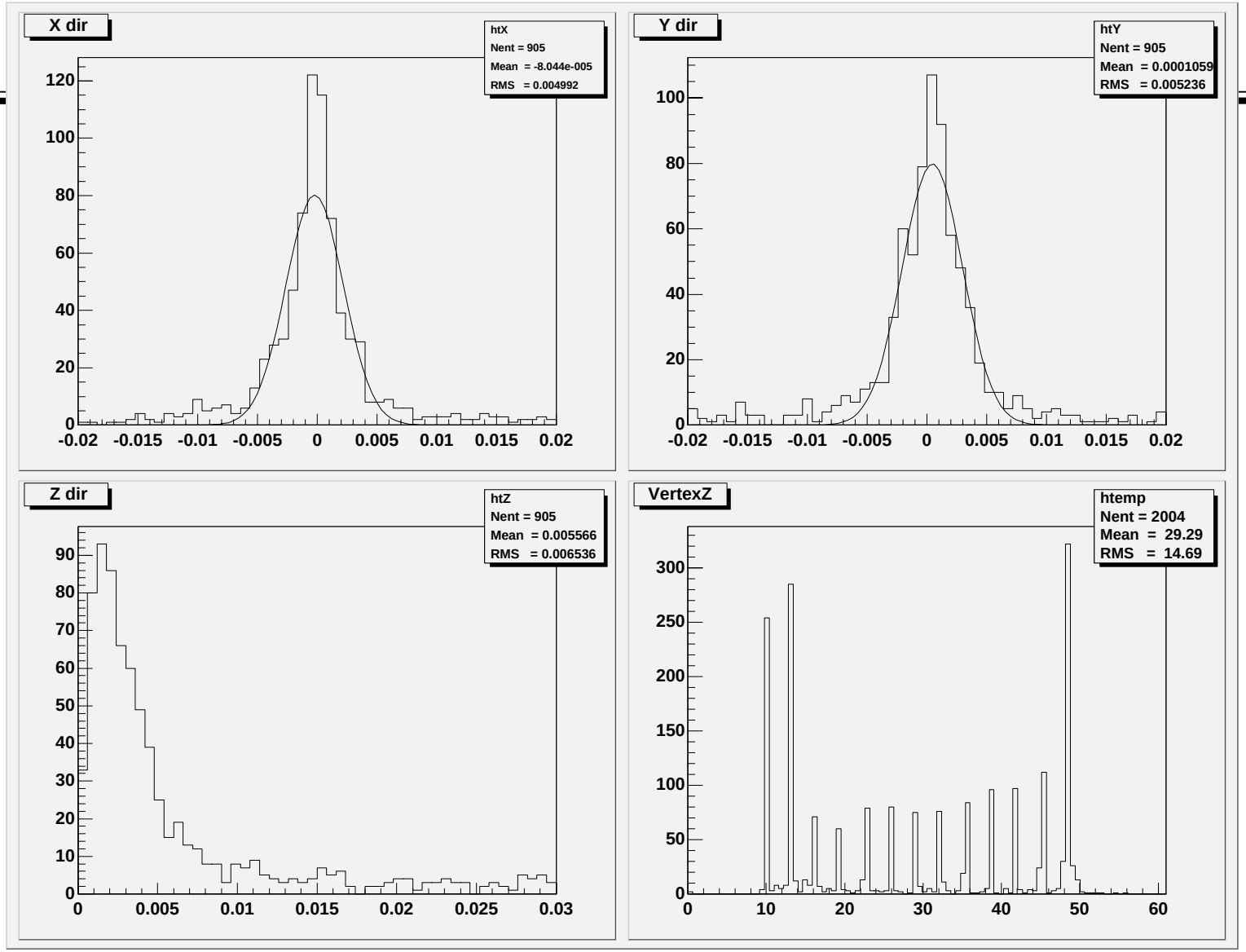

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