

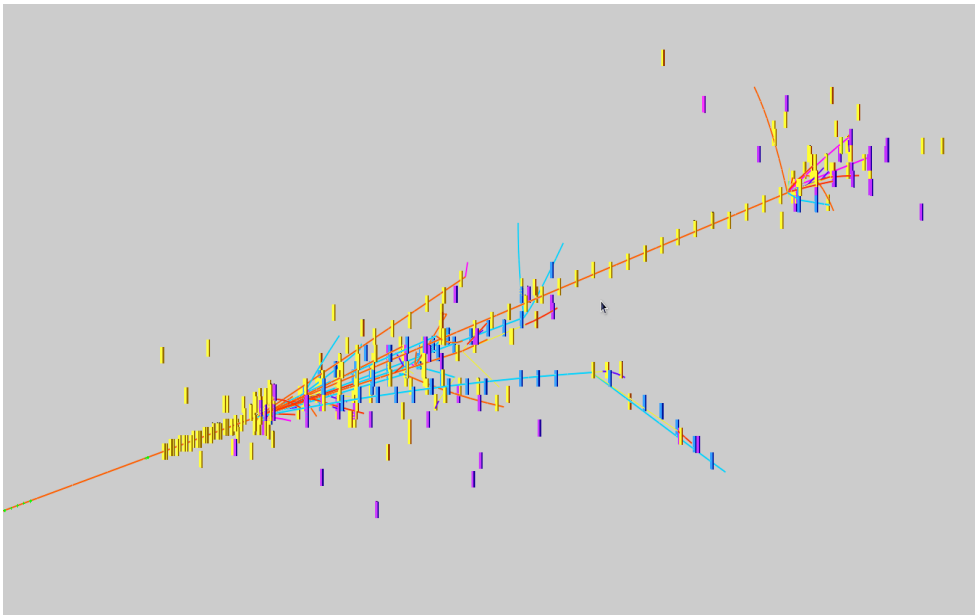
# News of DRUID

Manqi RUAN

Laboratoire Leprince-Ringuet (LLR)  
Ecole Polytechnique  
91128, Palaiseau

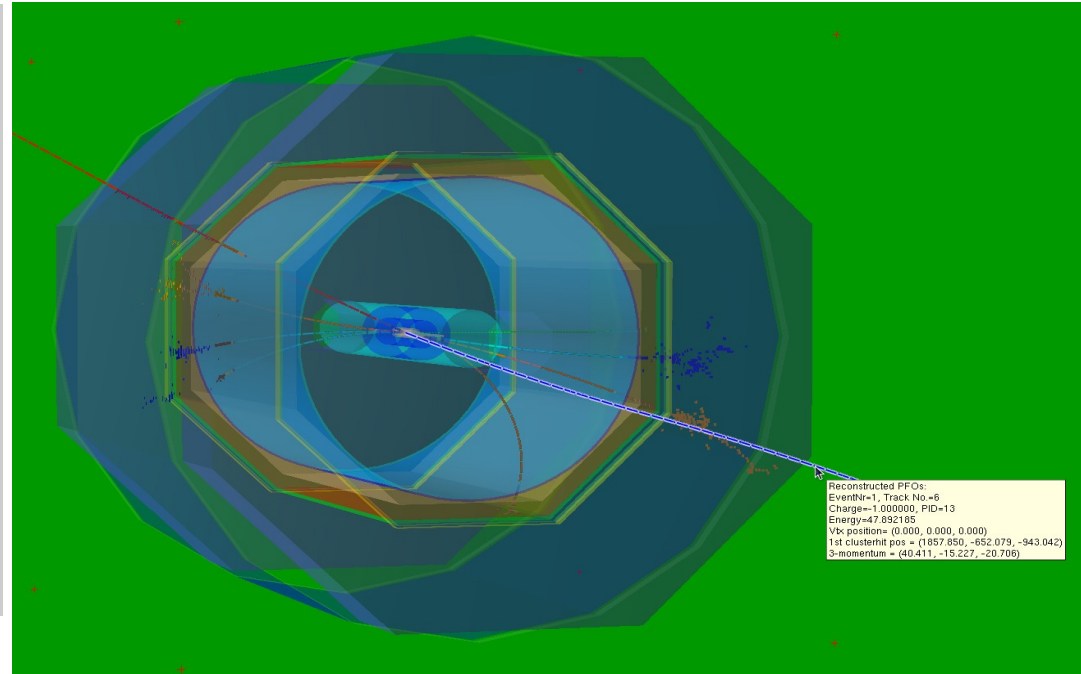
- Introduction
  - Upgraded to version 1.5
  - Motivation & Supported detector type
- Objects & Options
- Examples:
  - Full Reconstructed ILD event
  - CALICE Test beam data
- Summary & plans

- Motivation:
  - To understand the ILC events & jet/shower details
  - To **understand/analysis reconstruction algorithm** performance



*Left: 40GeV pion shower*

*Right: 230GeV Z( $\mu\mu$ )H( $\tau\tau$ ) event*

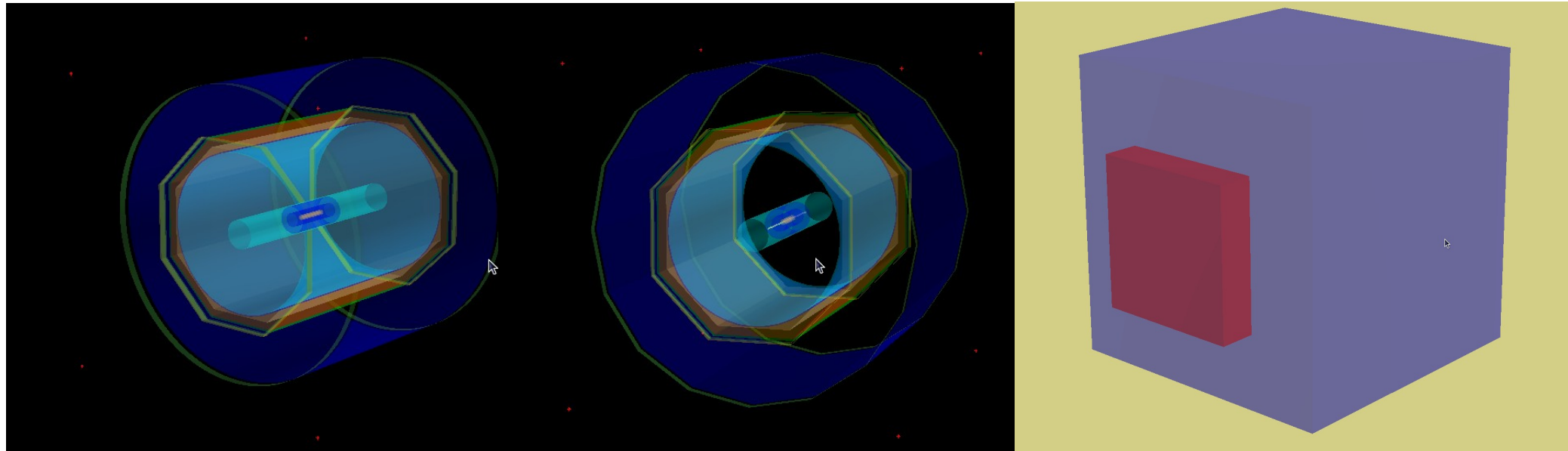


*Developed by Manqi, Vincent, Gabriel, Daniel & Jayant*

- Based on ROOT TEve class (developed for LHC event display)
- Visualize detector geometry, MC/reconstructed Particle, simulated/reconstructed hits in arbitrary combination and various style

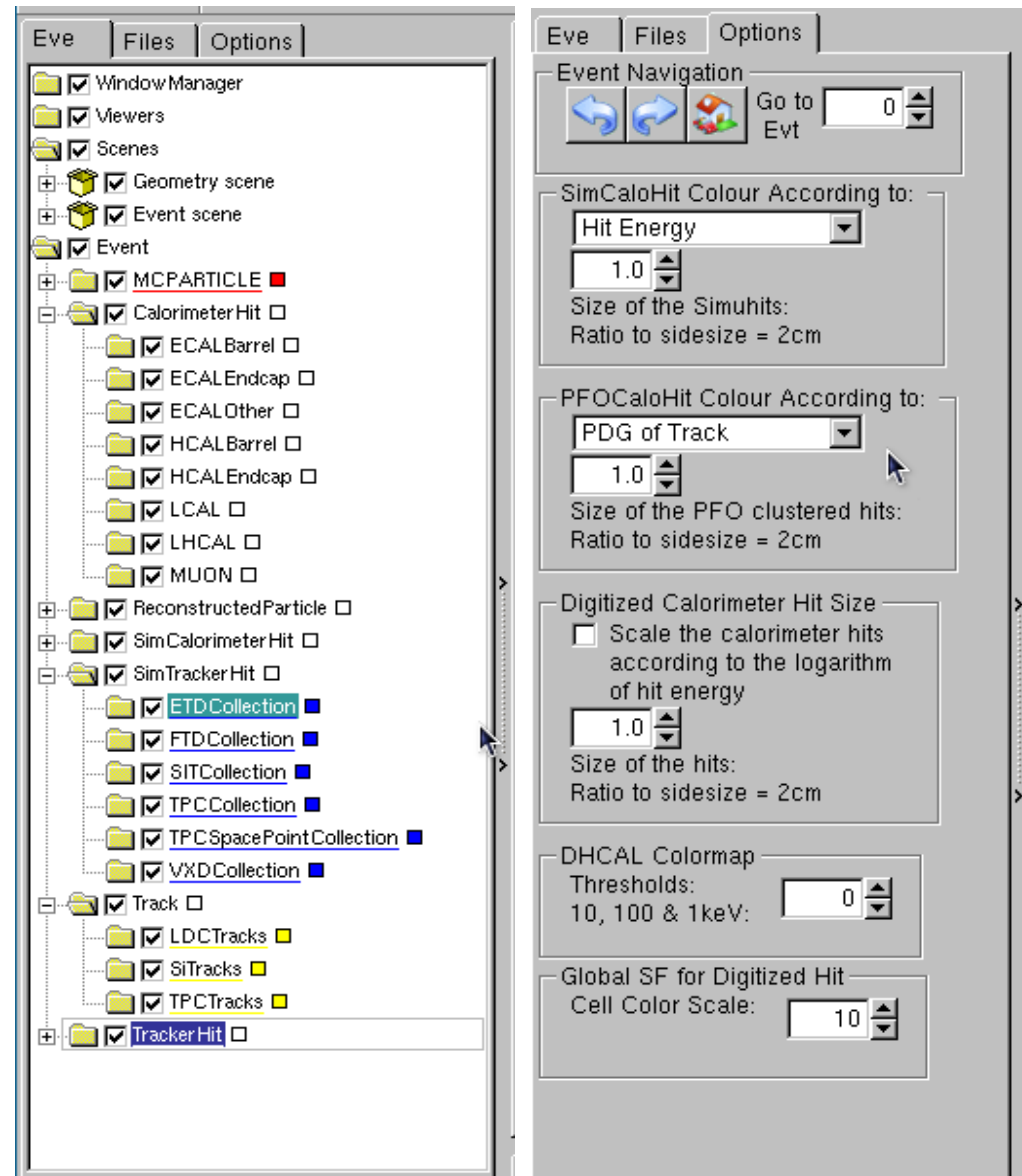
- Input: LCIO (data file) + GEAR (geometry file)

*Left to Right: a la Videau, TESLA (DHCAL EndCap dismantled) & Test Beam*



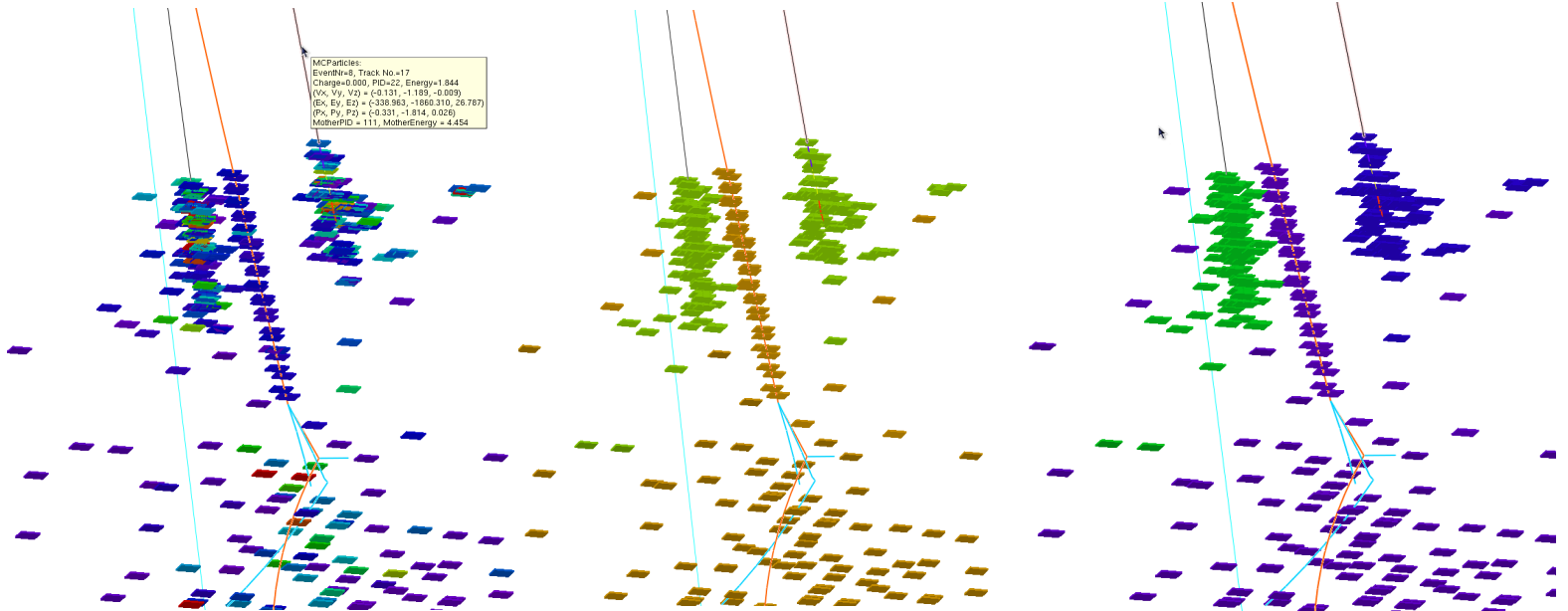
- Supported geometry
  - ILD with TESLA/a la Videau HCAL
  - Calice test beam frame (parameters not tuned)
  - Mount/dismount sub detectors interactively in GUI

- Detector Geometry
- LCIO information (**Reorganized** since Druid 1.4):
  - MCParticle: tracks. To mark event type, mother particles at VTX can be displayed as arrows
  - CalorimeterHits (simulated, digitized & clustered): cuboid with tunable size and color according to Energy, PID, Mother PID & index
  - ReconstructedParticle (PFO): track + assigned cluster
  - TrackerHits (simulated, digitized & track assigned): points with different color
  - Skipped collections: LCRelation, Vertex
- Interactive GUI: option panel

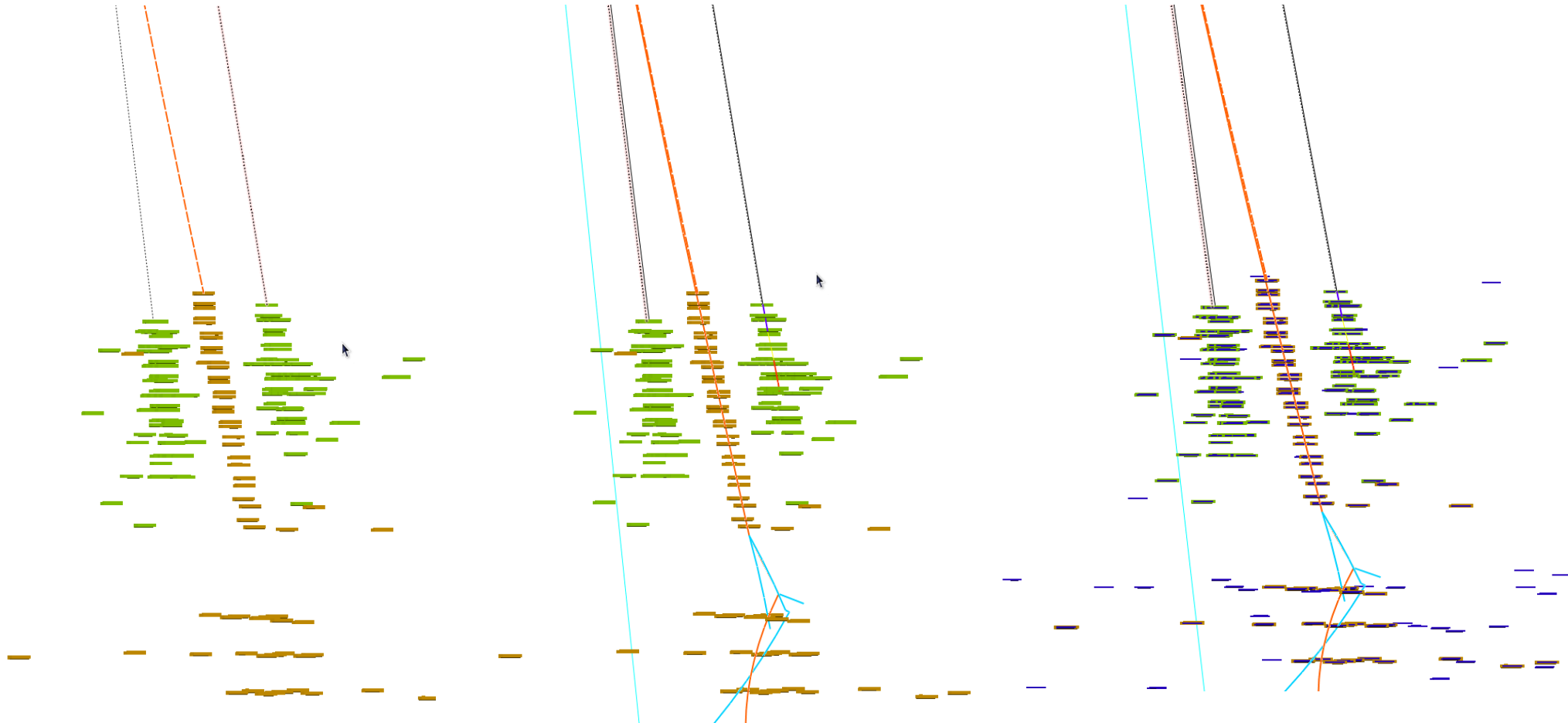


- General:
  - Zoom, Rotate (with arbitrary center), Project, Tunable illuminating & background, Reference coordinates & points setting...
- For Individual objects:
  - Pick up & read attached information
  - Display/hidden: **inherit** the status from last event & always display new collections
- Tips:
  - Patient with the **first** event (*initialized the window, reading through all data file, display every collection... ~5 sec for fully reconstructed qq evt@91.2 GeV, with ~1G file size. Machine: DELL Latitude E6500*)
  - Switch off collections not really interested & geometry

*Tau jet ( $\tau \rightarrow \nu + \pi^0 + \pi^+$ )  
with different color  
option: energy, PID &  
index*



Display reconstructed & MC objects simultaneously:



Same  $\tau$  jet, from left to right:

- PFO;
- PFO + MCParticle;
- PFO + MCParticle + MC Calo Hits (with uniform blue color);

# qq evt@91.2GeV

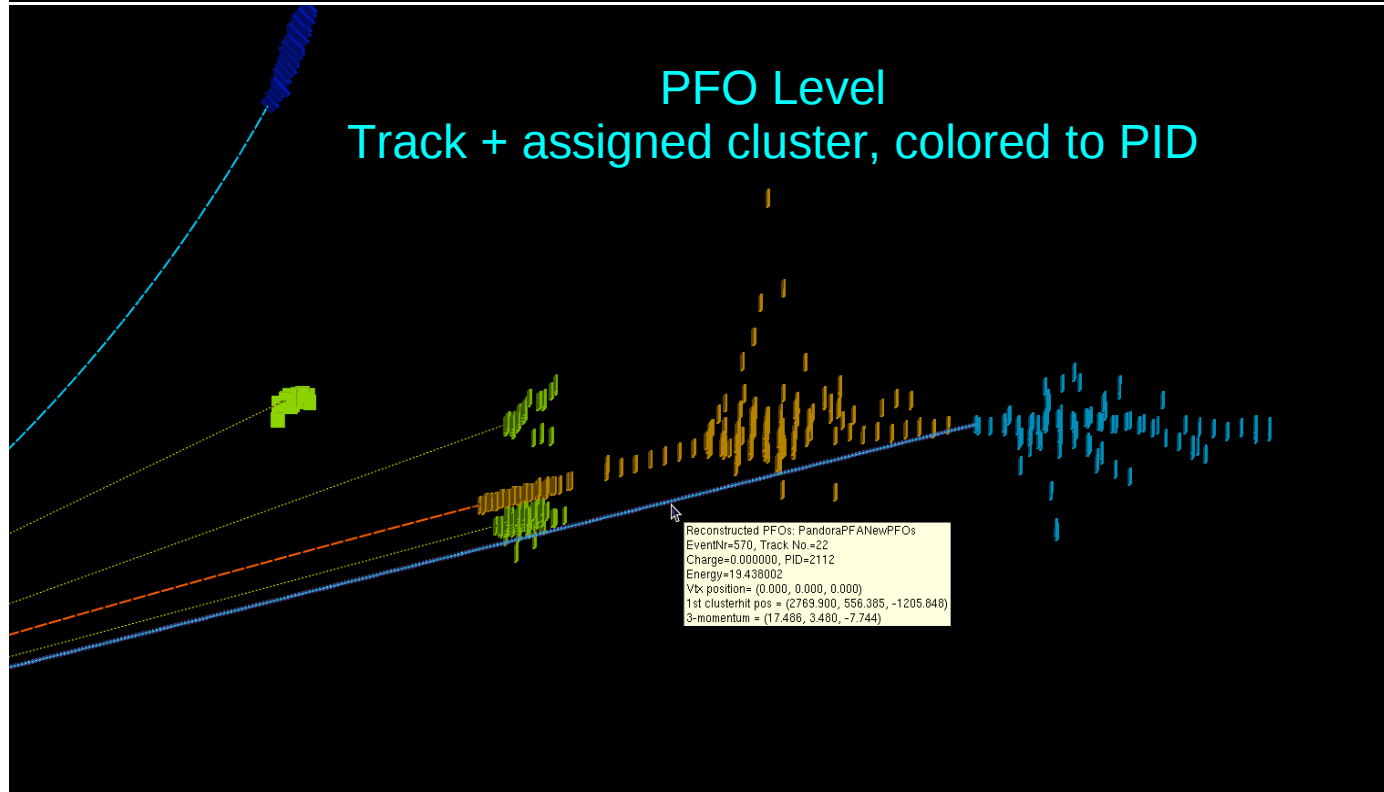
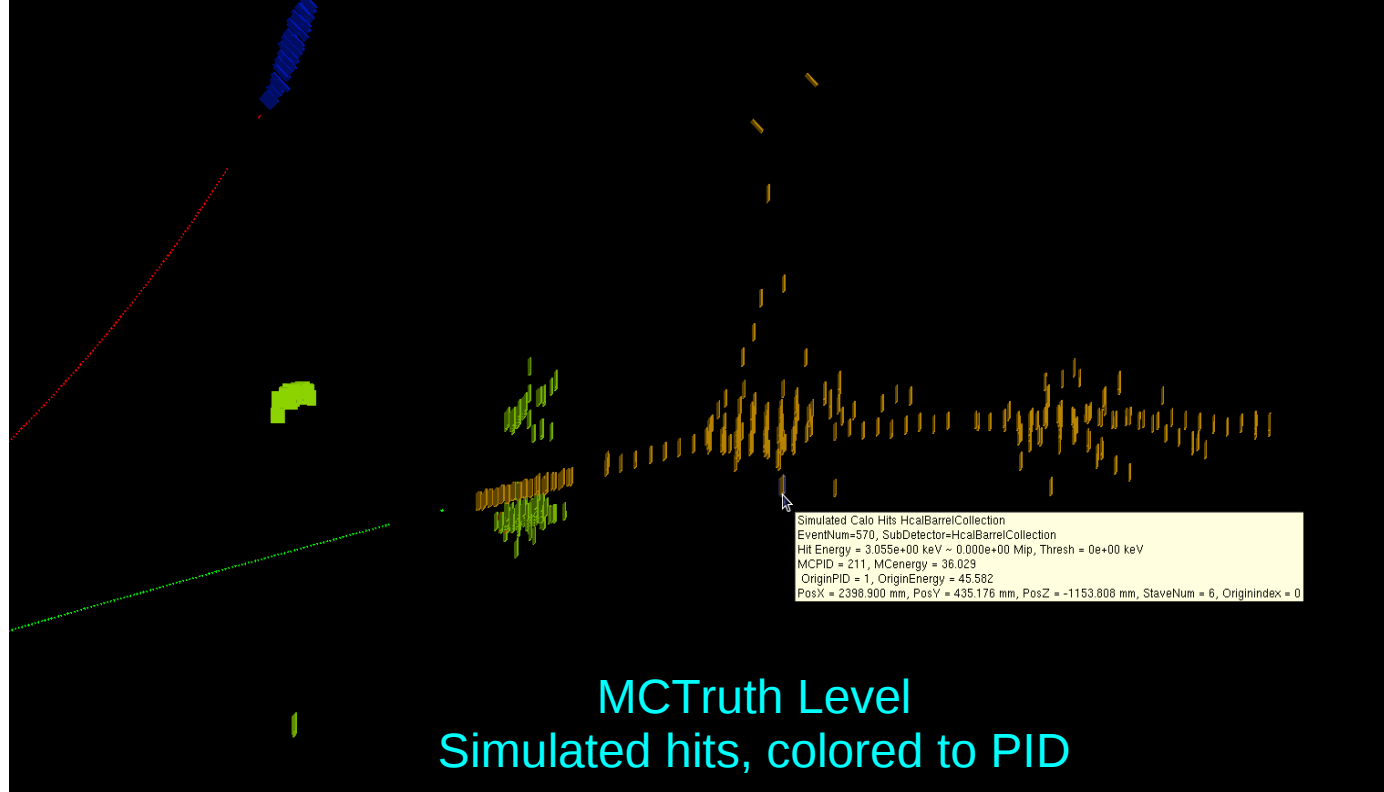
Total energy = 109 GeV,  
Total Neutral energy = 21.3 GeV

MCTruth level: 36GeV Pion

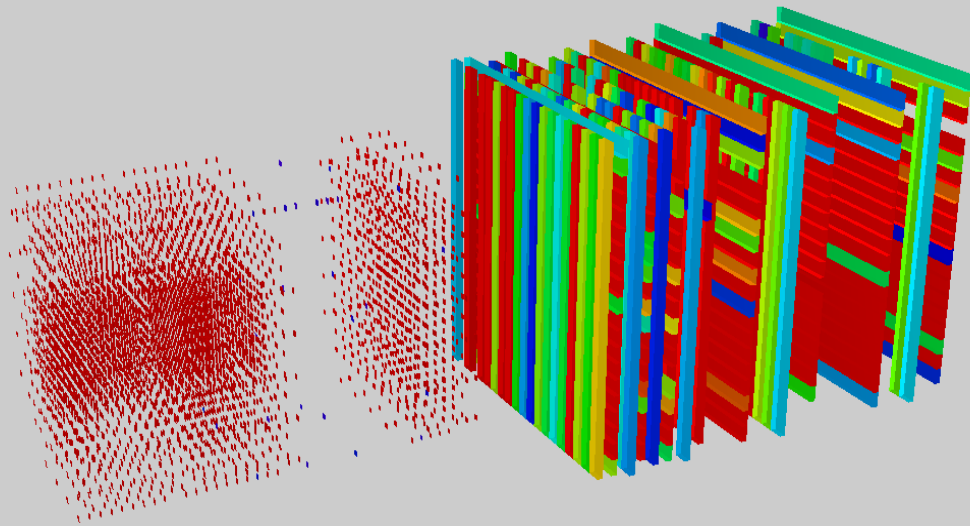
PFO level: 36GeV Pion with  
27.3GeV Cluster + 19.4GeV  
neutron

Splitting of hadron cluster: over  
estimated cluster energy + fake  
seed

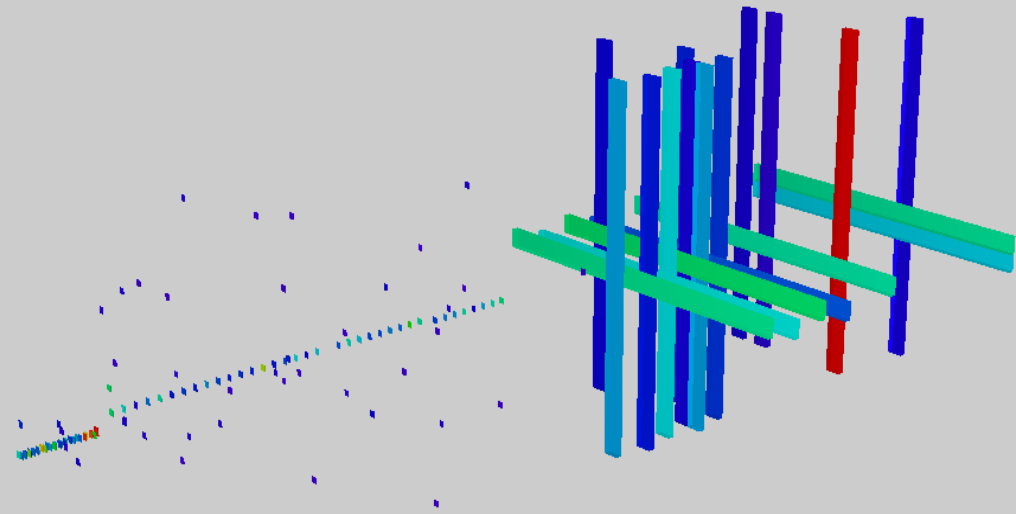
06/07/2010



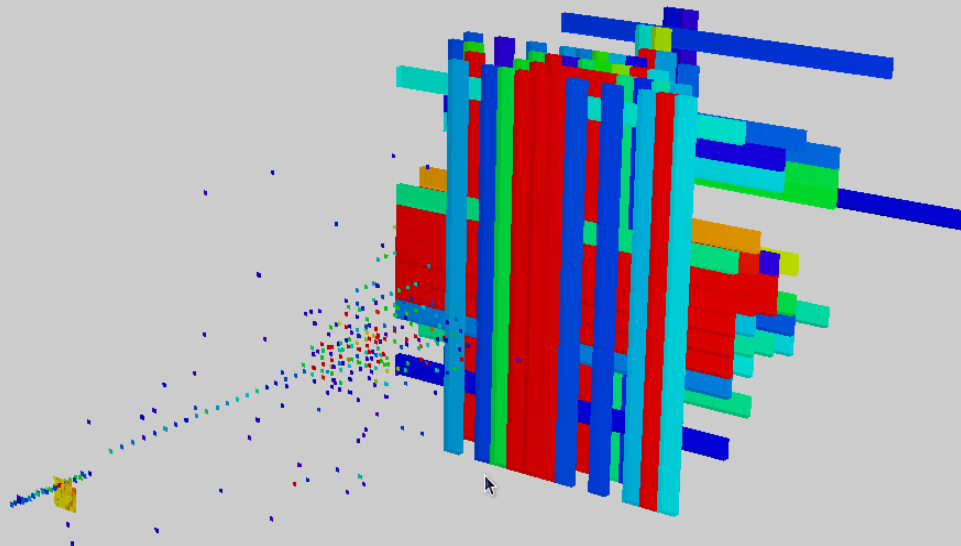




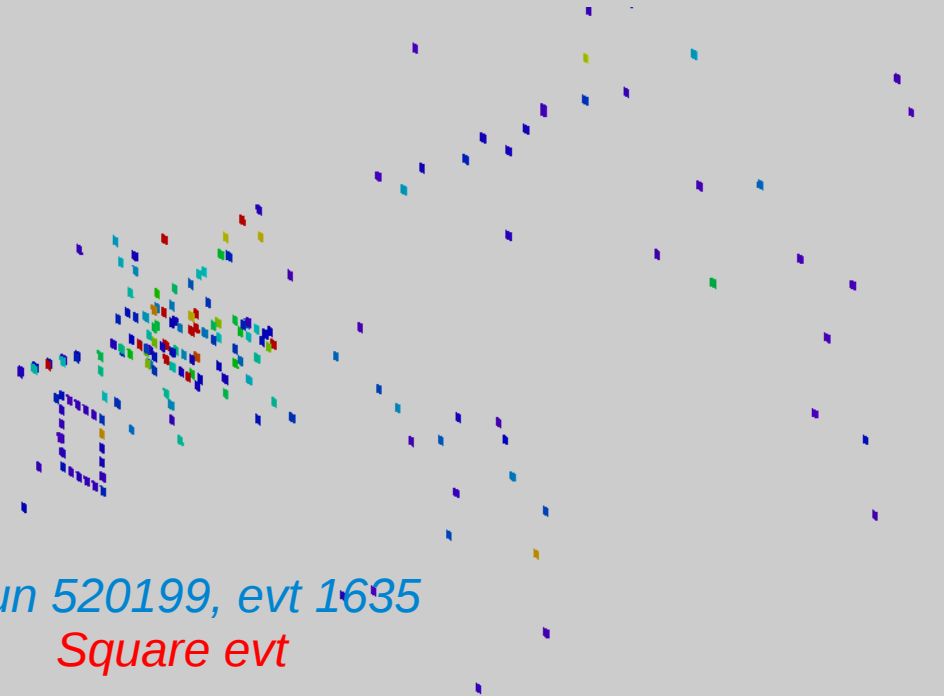
Run 330437, self Calibration evt



Run 330437, MIP evt:  
*Misalignment*



Run 330437, pion evt:  
*crazy ECAL wafer*

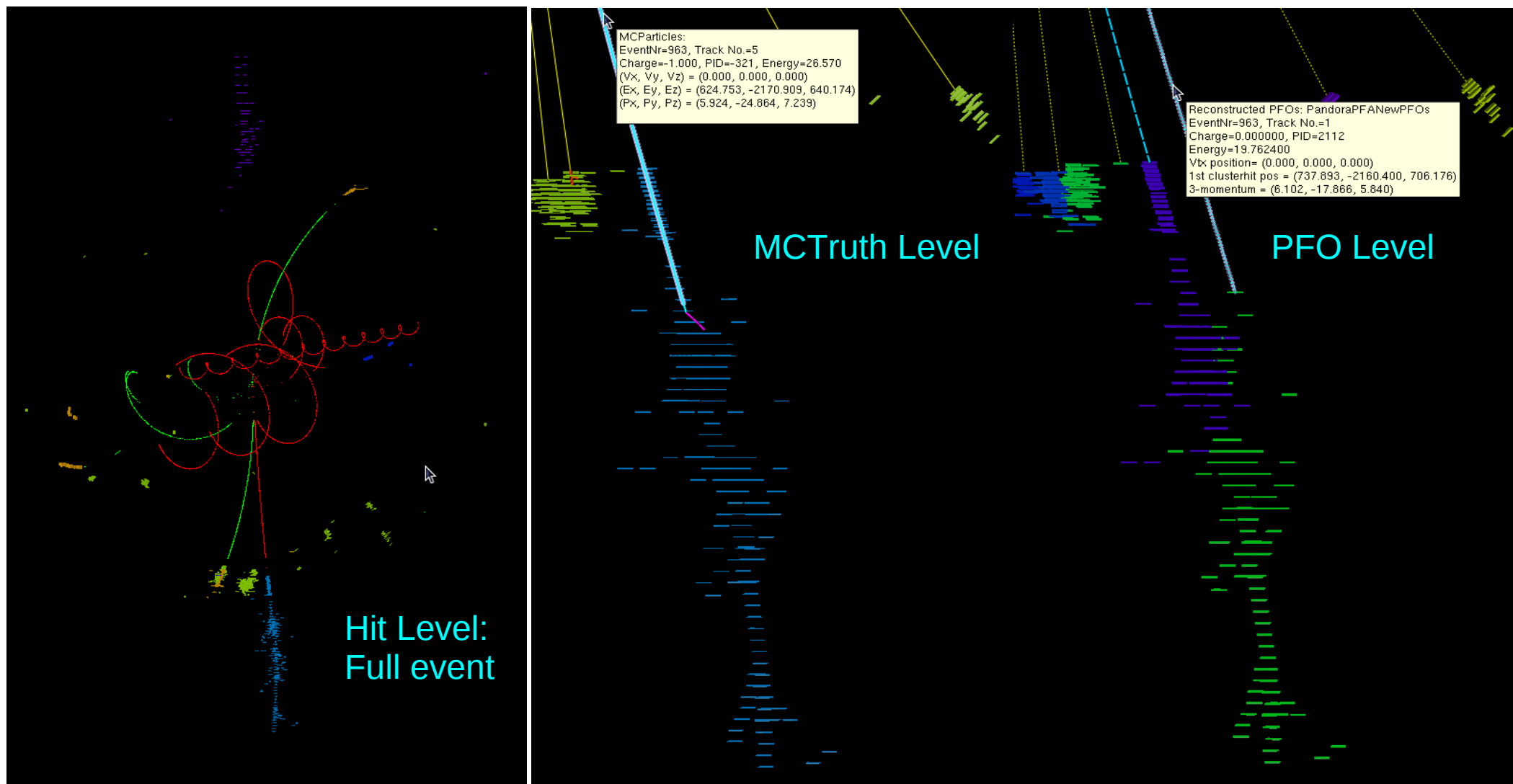


Run 520199, evt 1635  
*Square evt*

- Druid has been upgraded and tested with CALICE test beam event & full simulated/reconstructed ILD event. To be upgraded according to user's feed back.
- Availability: will be integrated into next release of ilcinstall, also
  - DESY SVN server:
    - Web access: <https://svnsrv.desy.de/viewvc/Druid/trunk/>
    - Svn public access: svn co <https://svnsrv.desy.de/public/Druid/trunk> Druid
  - LLR Forge: <http://llrforge.in2p3.fr/svn/Druid>
  - Personal web page: [http://polywww.in2p3.fr/~ruan/ILDDisplay/Druid\\_1.5.tar.gz](http://polywww.in2p3.fr/~ruan/ILDDisplay/Druid_1.5.tar.gz)
- For more information: see Druid manual at <http://polywww.in2p3.fr/~ruan/ILDDisplay/DruidNote.pdf>

Back up slides

Event 963: Total energy = 108.4 GeV,  
Total neutral energy = 59.23 GeV



MCTruth: 26.6 GeV K<sup>+</sup> and 21.1 GeV Λ<sup>0</sup> (upper, purple cluster);  
PFO: **misidentify** as one pion (25.6 GeV) with **25.7 GeV Cluster**  
and one 19.8 GeV neutron