

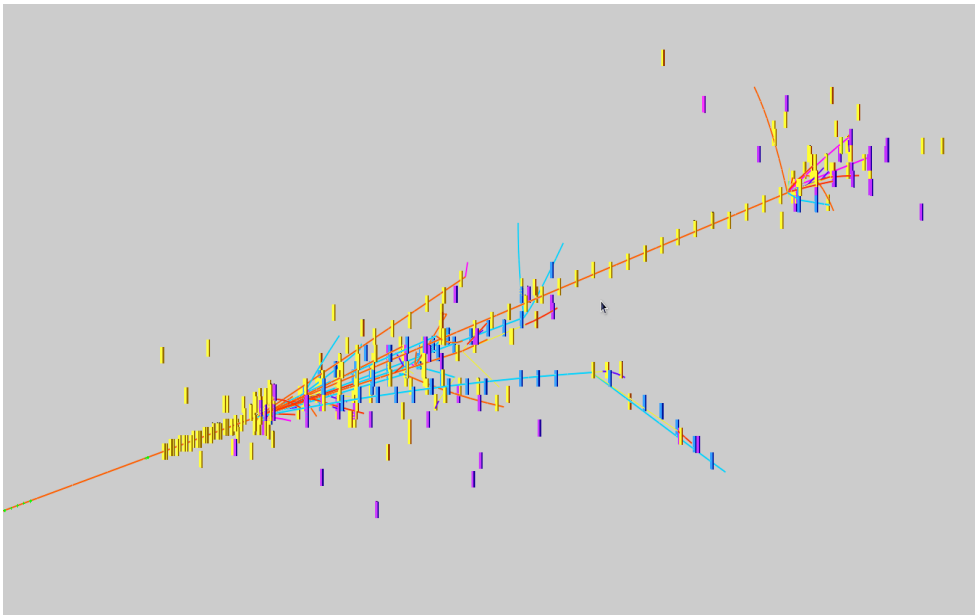
# New patterns in DRUID 1.8

Manqi RUAN

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

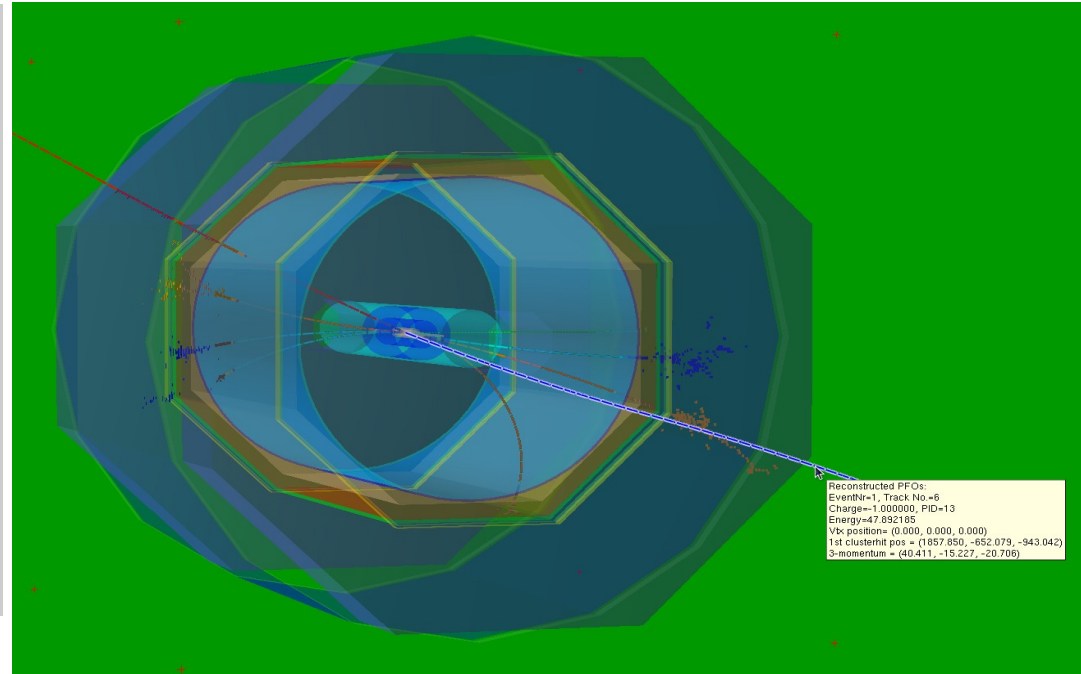
- Introduction
- What's new:
  - More supported Icio collections & flexible parameters managing
  - More buttons: changing styles/color & Collection selection ...
  - $P_T$  cuts for MCParticle & Stress testing with high-multiplicity events
  - **GDML Geometry browser**
- Summary & plans

- 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*



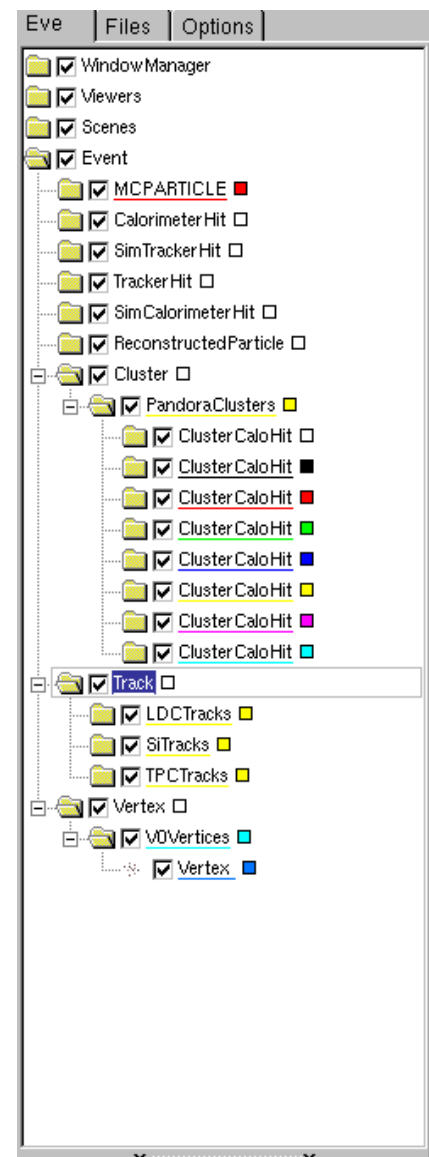
*Developed by Manqi, Vincent, Gabriel, Daniel & Jayant*

- Based on ROOT TEve class, visualize event information (in slcio file) and detector geometry (gear xml or **gdml** file) in arbitrary combination & different styles

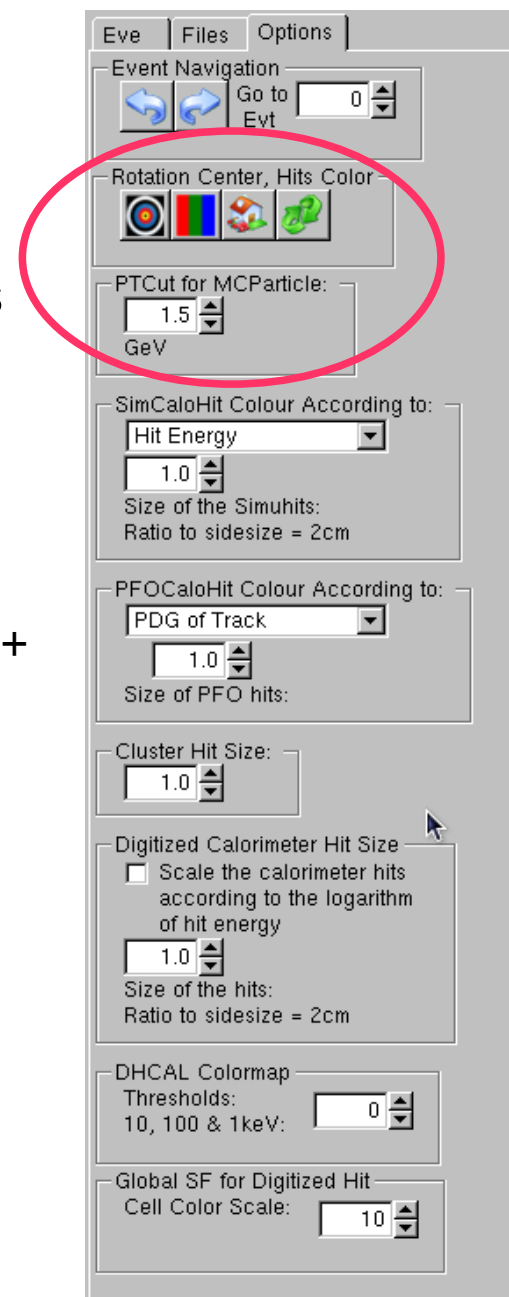
# What's new



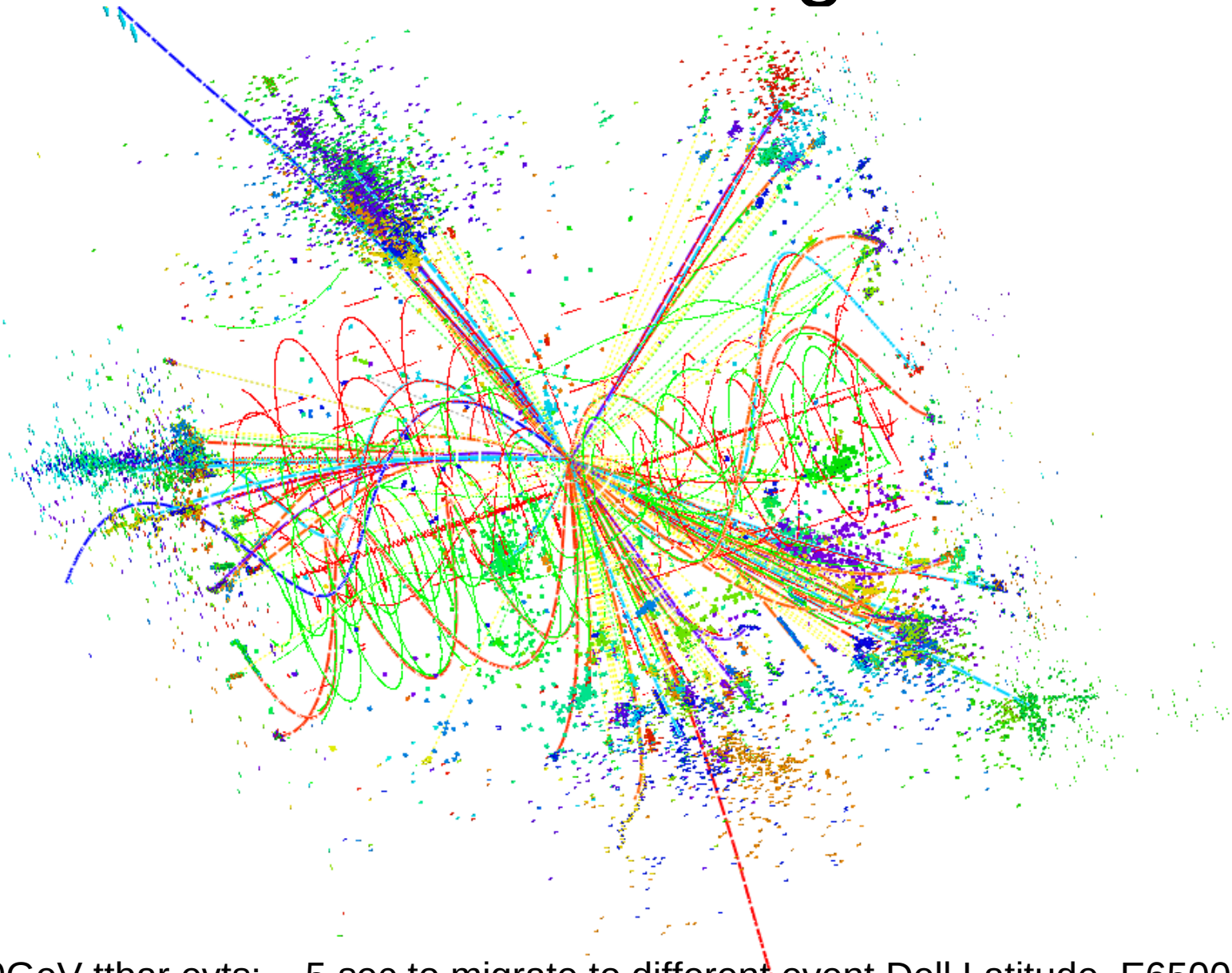
- More LCIO collections supported (trk, vtx, cluster)
- Flexible parameter managing beside the steering file
  - *bin/Druid*: print a instruction for the input format
  - Separate geometry & data display
    - *bin/Druid \*.slcio*: display the first event in given slcio file
    - *bin/Druid \*.gdml(\*.xml)*: display detector geometry
  - Together with other arguments:
    - *bin/Druid \*.slcio \$EventNumber*: given event in given slcio file
    - *bin/Druid \*.slcio \*.gdml(\*.xml)*: first event & geometry
    - *bin/Druid \*.slcio \*.gdml(\*.xml) \$EventNumber*
    - *bin/Druid \*.slcio \*.gdml(\*.xml) \$RunNumber \$EventNumber*
- Screen output with collection statistic and sub detector list



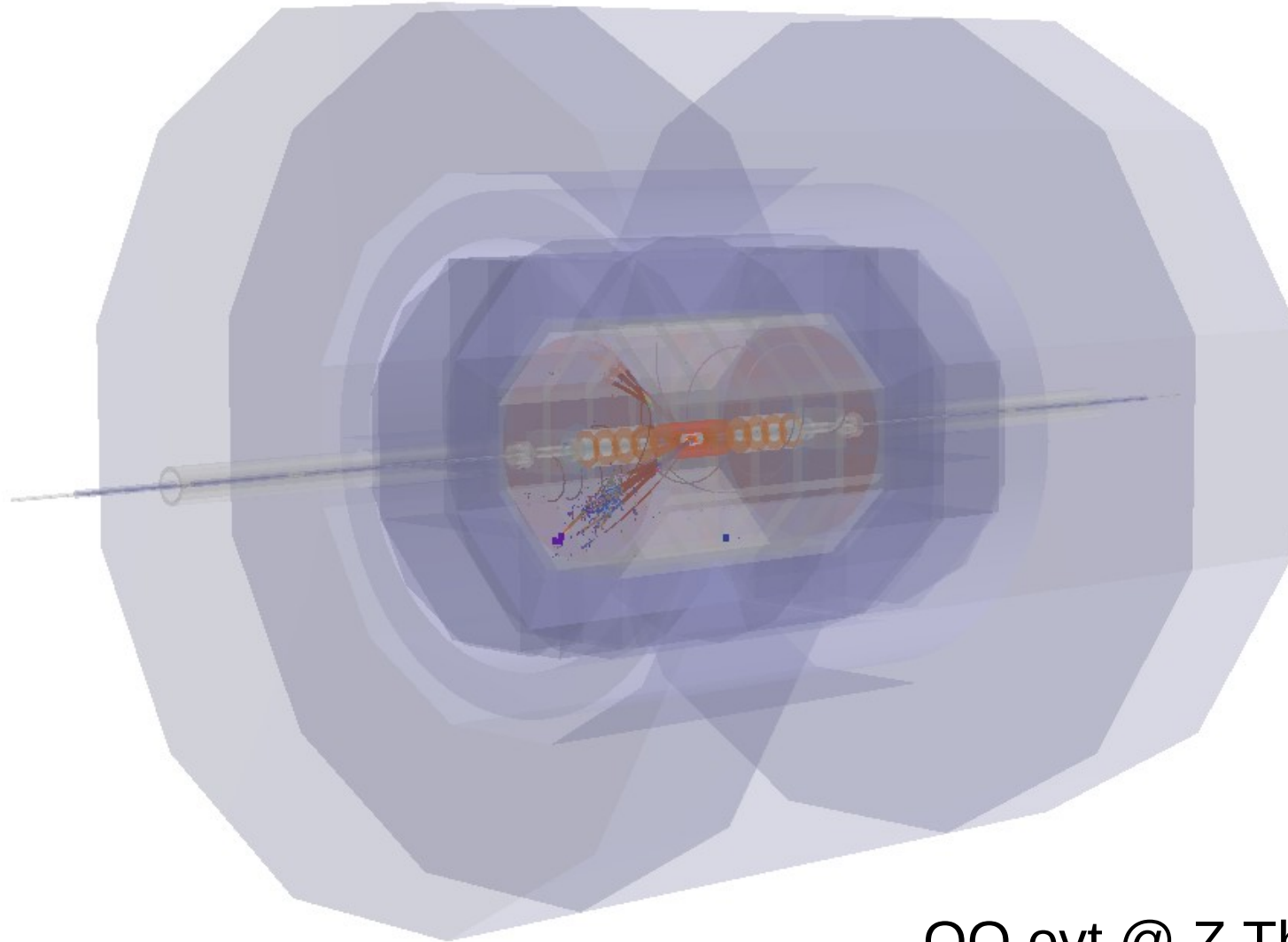
- Buttons: from Left to Right
  - Target: select rotation center
  - Reroll object color if supported, i.e, calorimeter hits
  - Drew back display to origin orientation & scale
  - Collection selection: switch between two scenario
    - Minimal (default):  
*MCParticle + Simulated Hits (+ Reconstructed PFO + geometry if available)*
    - Maximal:  
*All supported collection, including digitized hit, cluster/tracker, vertex, etc*
- $P_T$  Cut on MCParticle: accelerate the display



# Stress testing

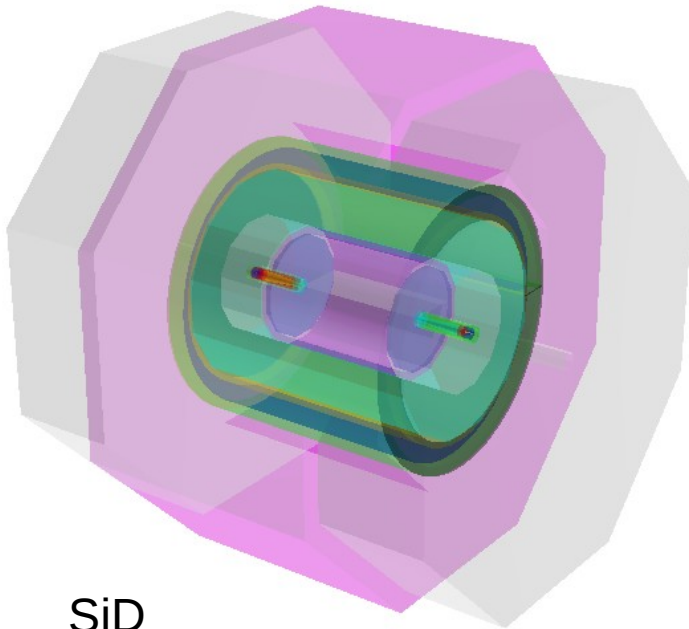


With 500GeV ttbar evts: ~ 5 sec to migrate to different event Dell Latitude, E6500

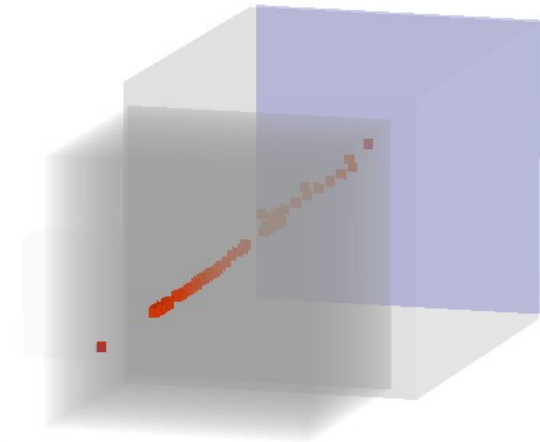


QQ evt @ Z Thr, ILD





SiD

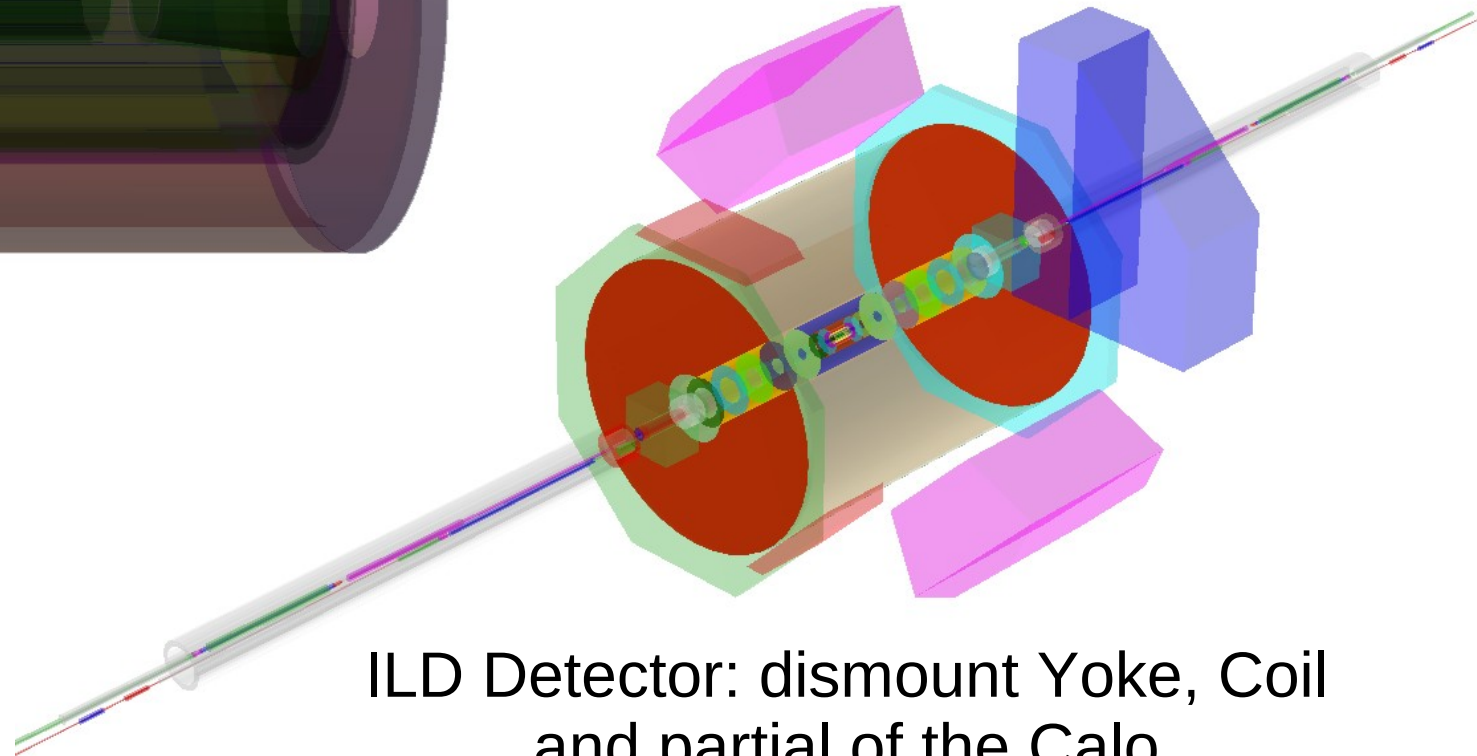
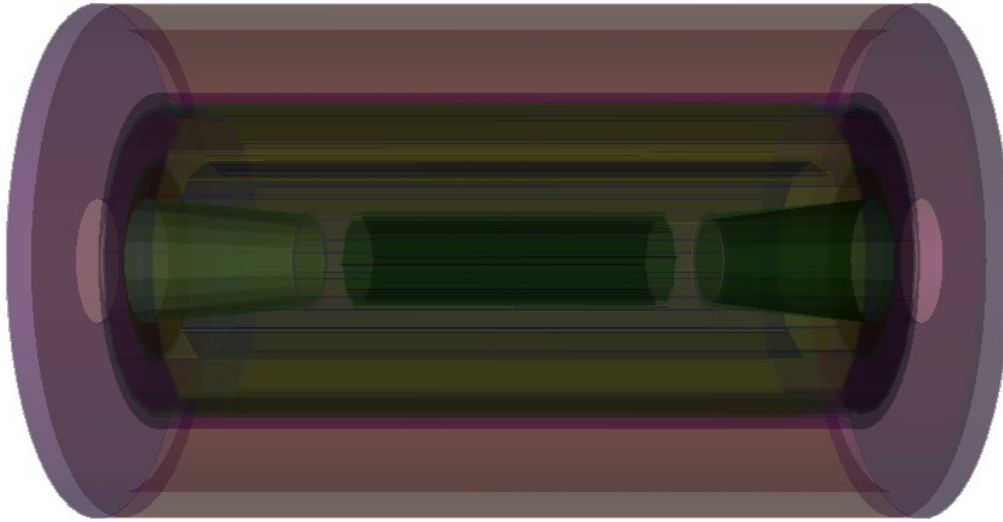


Simulated 10GeV Muon event  
with TBCern1006

- GDML file: **simulation level** geometry information, could be dumped from Mokka ( higher than mokka 07-03, and converted to root file for Druid)
- Druid Option:
  - Tunable transparency, color, background, mount/unmount sub detectors...
  - **Tunable display depth**



Inner Detector of ILD: Vtx, SiD...

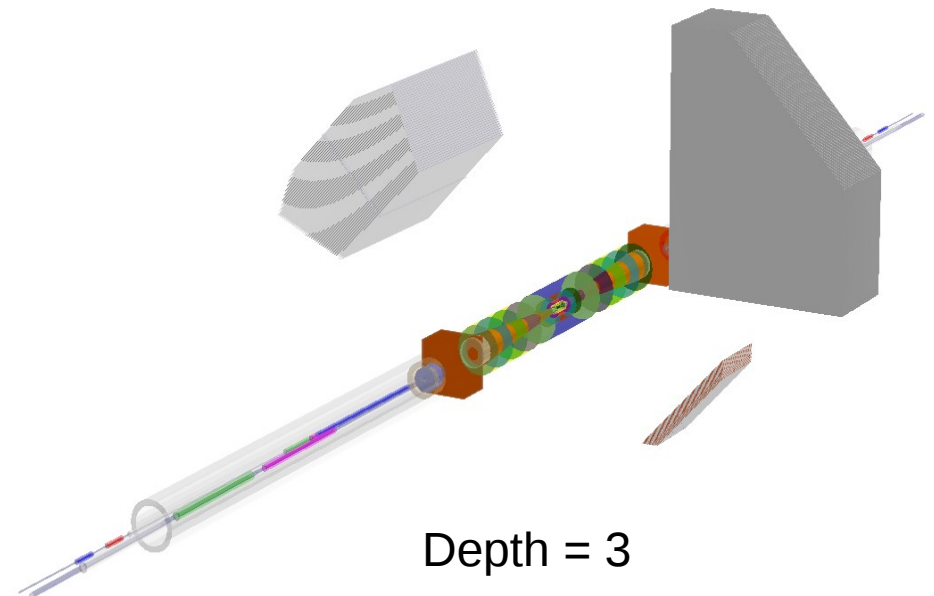
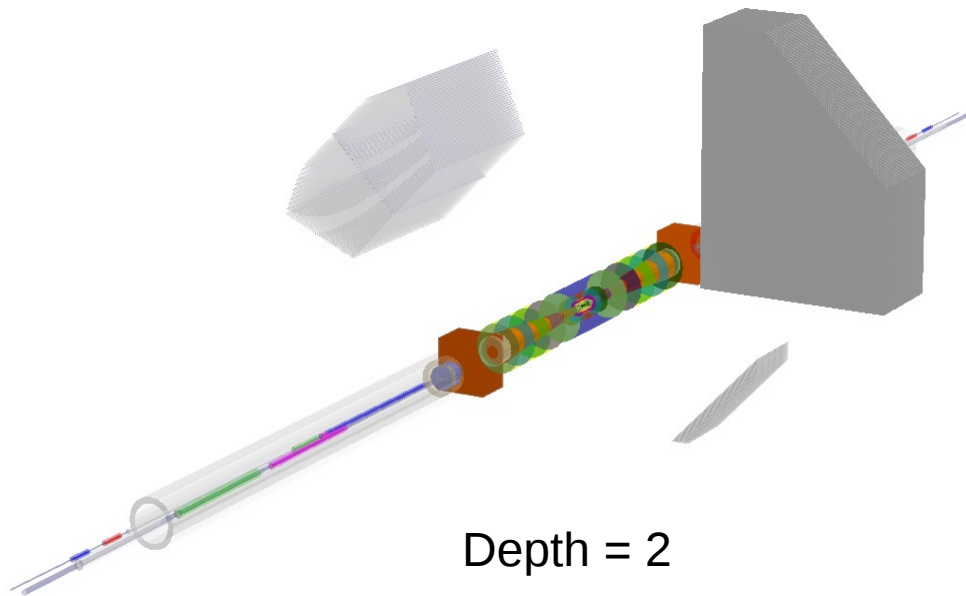
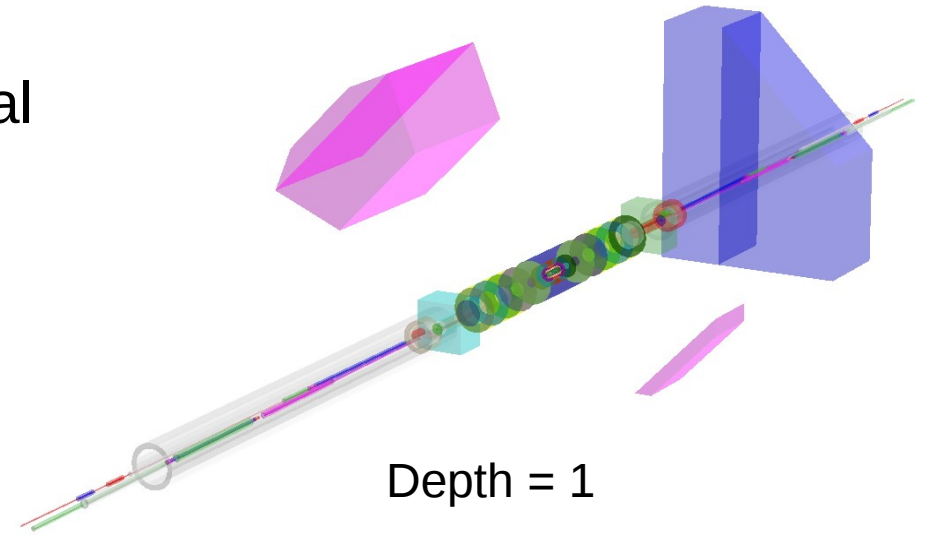


ILD Detector: dismount Yoke, Coil  
and partial of the Calo

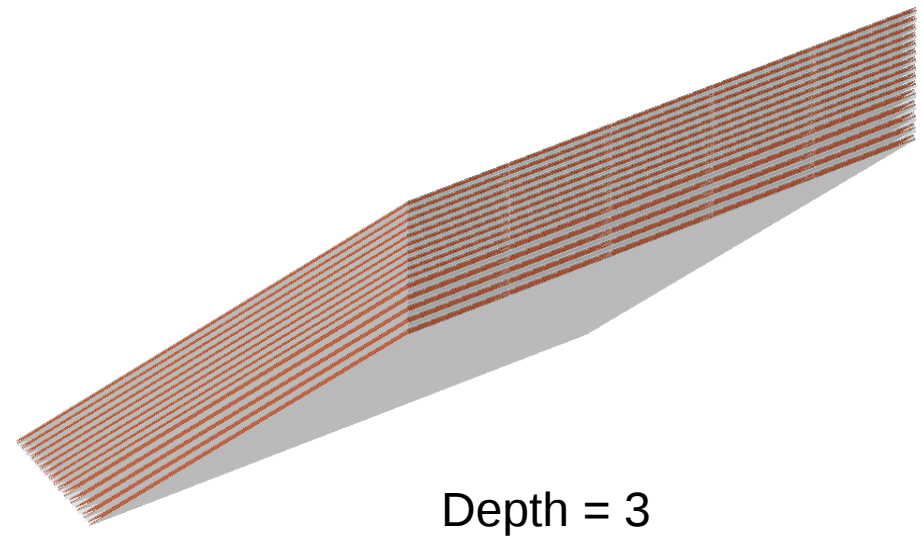
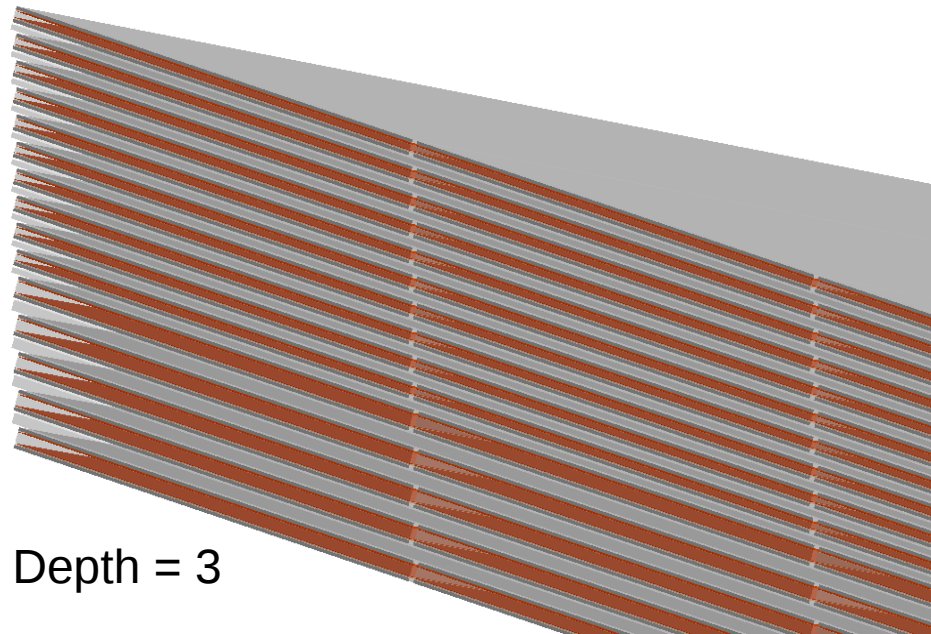
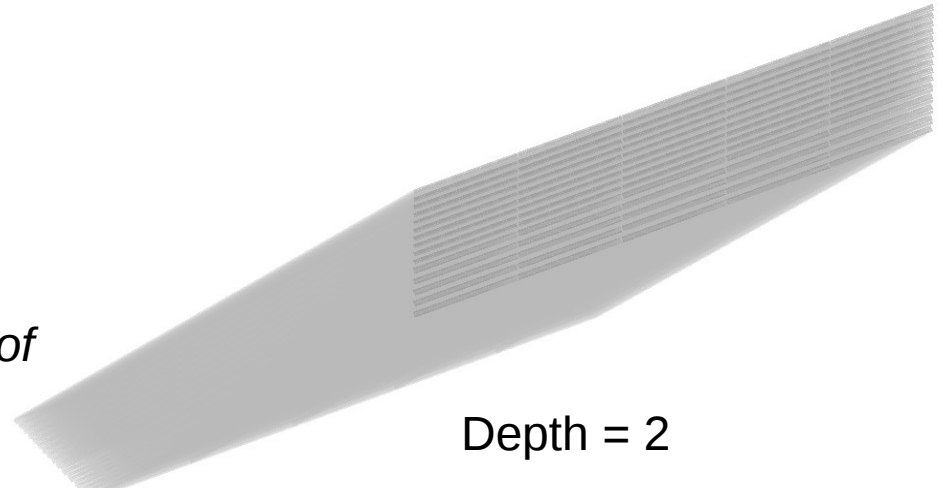
# Changing display depth



- Based on the hierarchy of geometrical volume defined in gdml file
- Higher Depth = More detailed info



- ECAL Module:
  - *Depth = 1: Total Volume (fine for [Event Display](#))*
  - *Depth = 2: Divided into different slabs*
  - *Depth = 3: Equip each slab with layers of different materials (simulation level)*



- Summary

- New patterns added, make Druid more flexible & easy to use
- Together with the gdml file, Druid could work as a geometry browser, allows to visualize detector geometry information up to simulation level

- Availability:

DESY SVN server: [svn co https://svnsrv.desy.de/svn/Druid/trunk](https://svnsrv.desy.de/svn/Druid/trunk) Druid

LLRforge: [svn co https://llrforge.in2p3.fr/svn/Druid/trunk](https://llrforge.in2p3.fr/svn/Druid/trunk) Druid

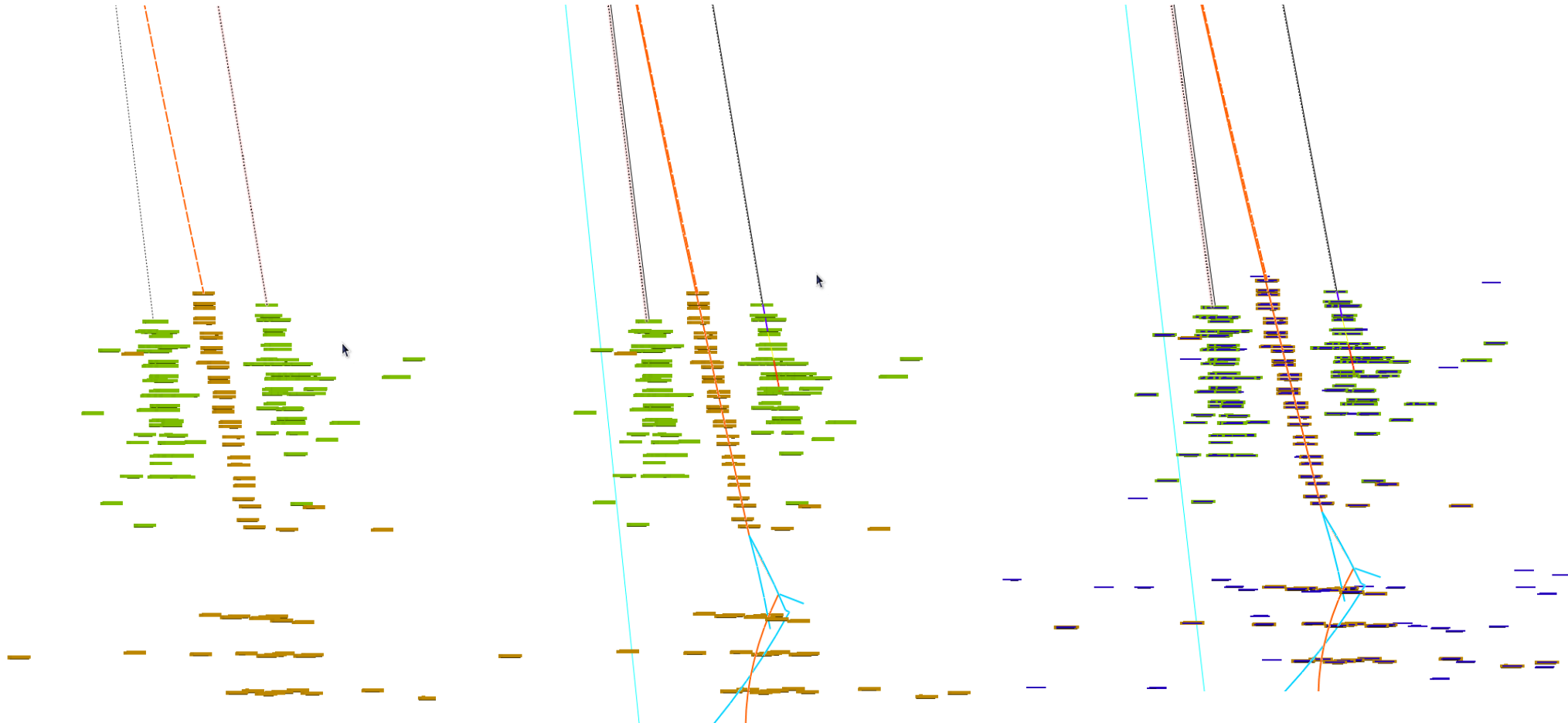
and <http://llr.in2p3.fr/~ruan/ILDDisplay>

- To do

- Improve the hierarchy in Mokka gdml file: easier to browser

# BK Slides

Display reconstructed & MC objects simultaneously:



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

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