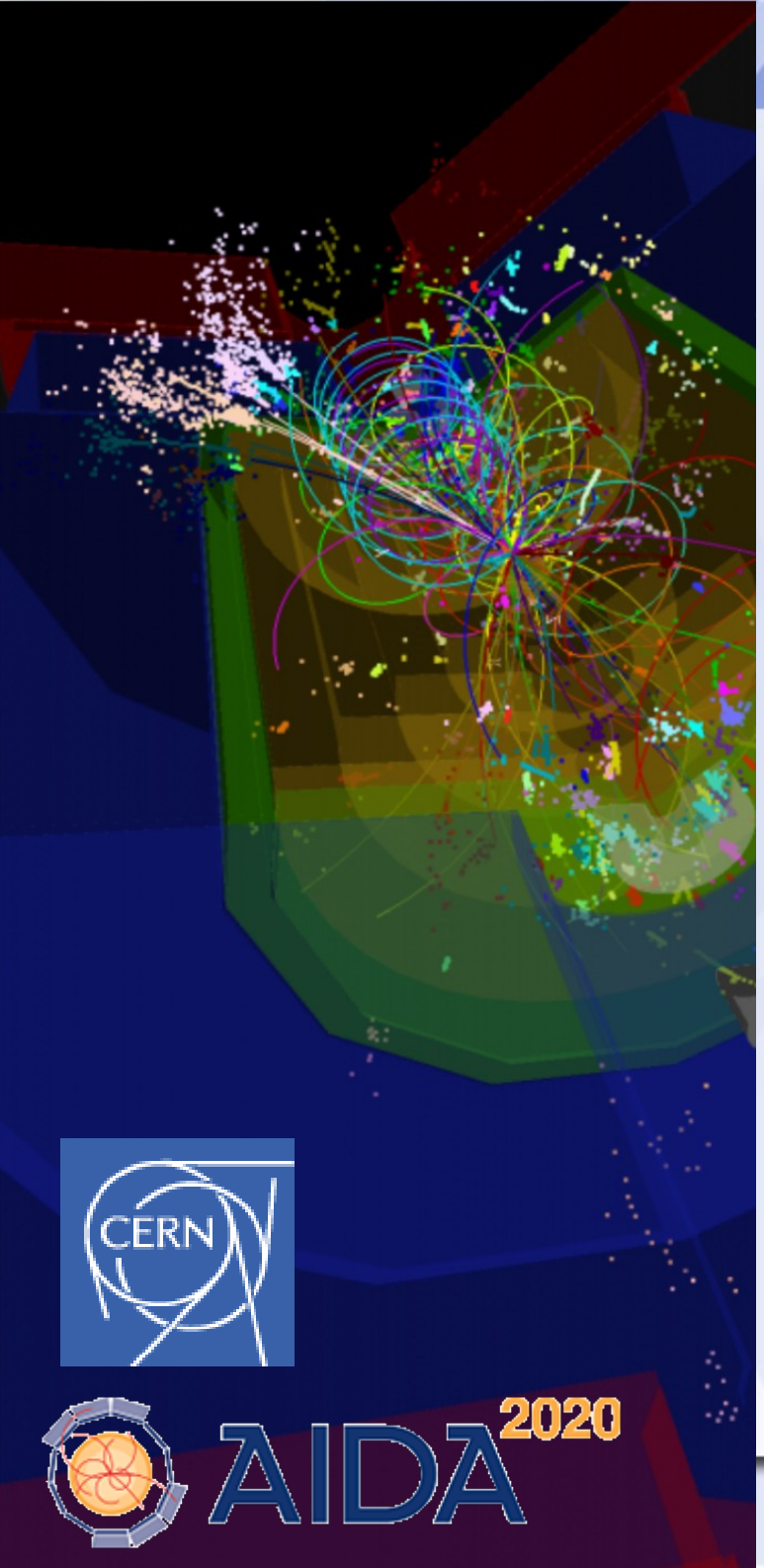


DD4hep Status

Recent activities

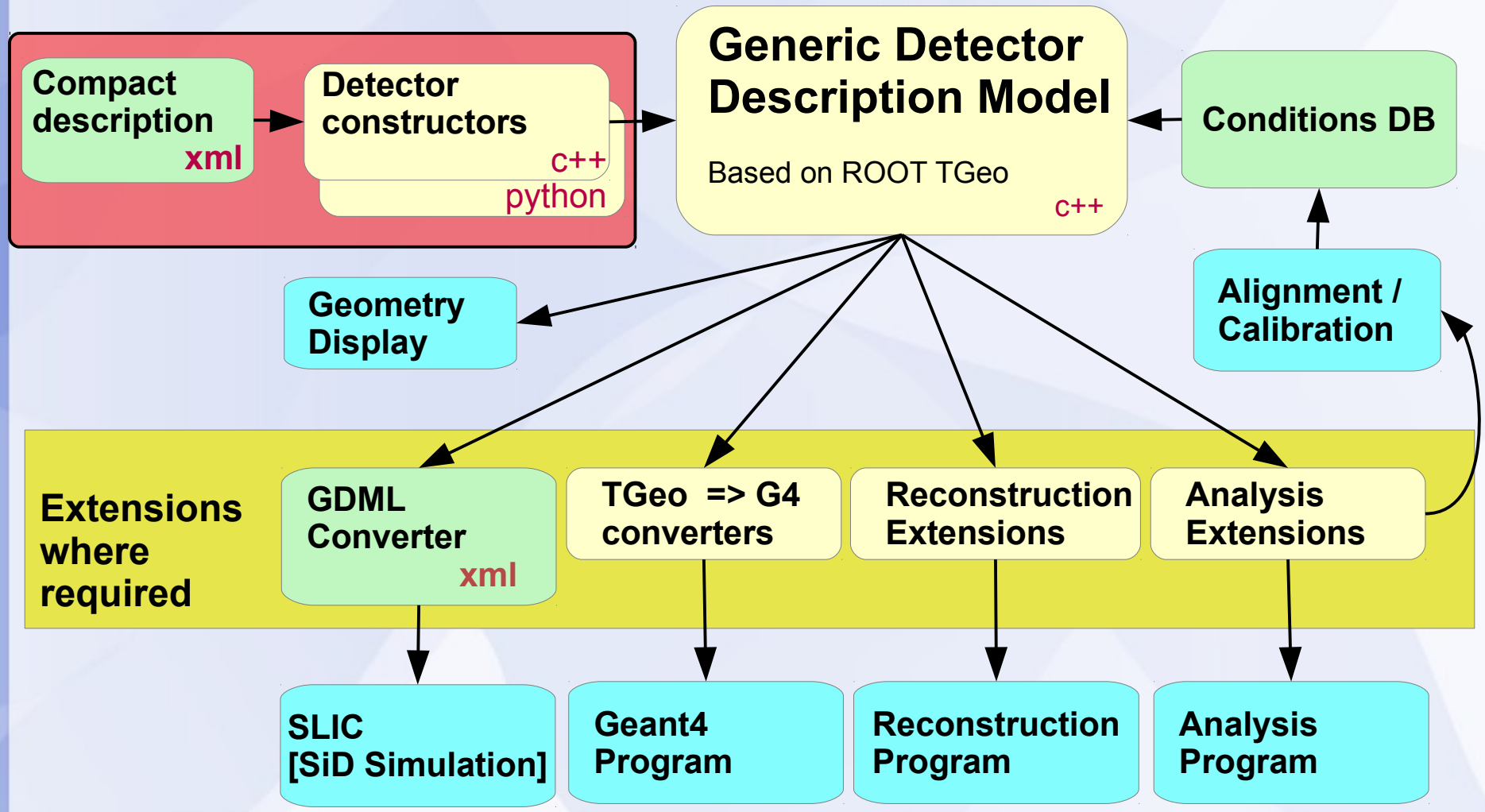
DD4hep Investigated by CMS

- Got approached by Yana Osborne (CMS) about DD4hep
- First informal talk
- ...followed by a small test using the CMS tracker
- Let's see how it went

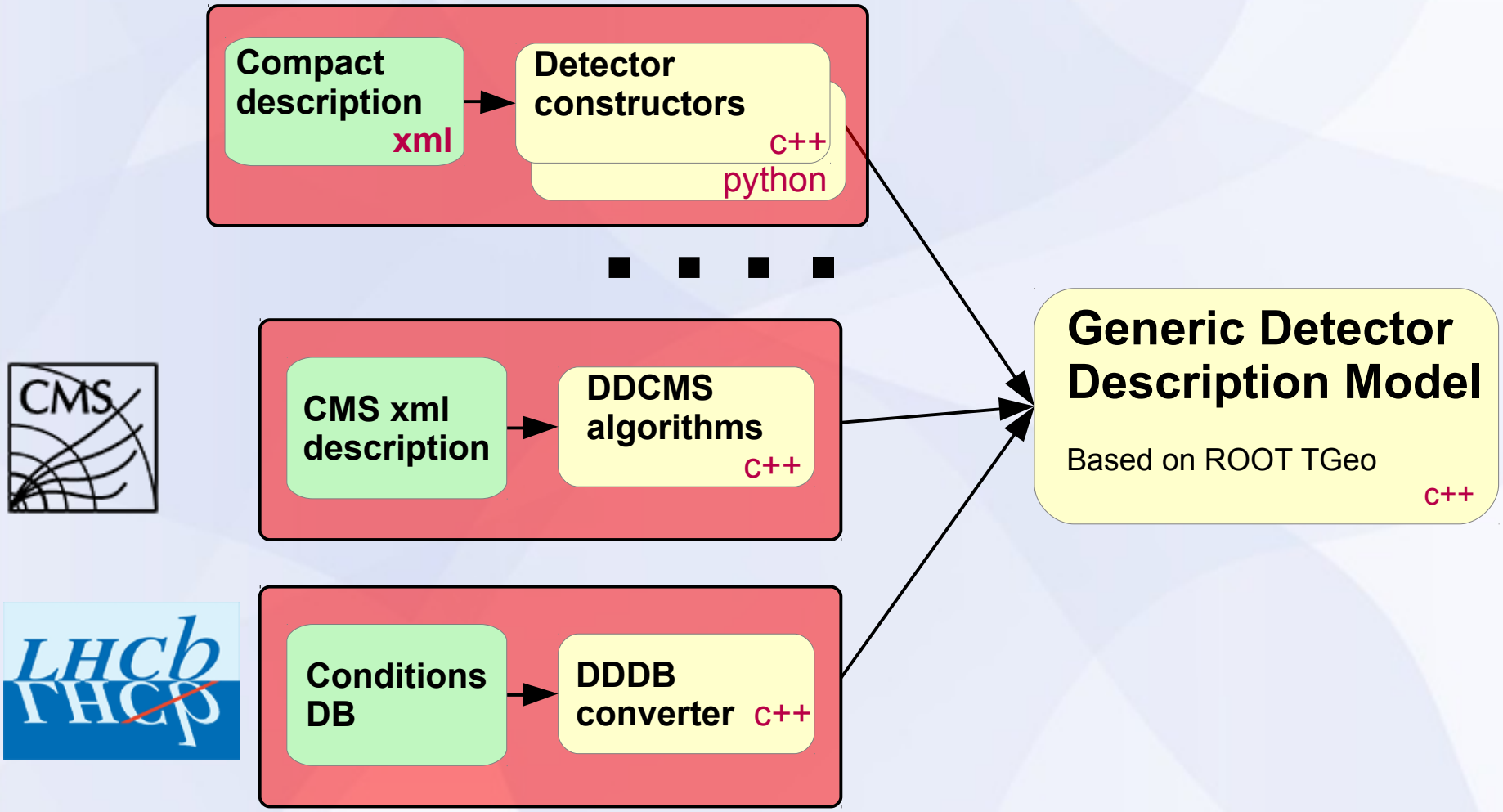
Bootstrap DD4hep for CMS

- Requirement
  - Keep CMS xml input source (backwards compatibility)
  - Adapt the population step for CMS
  - Rewrite expansion algorithms
- Similar approach as used for the LHCb parser
- But:
  - Only geometry conversion
  - Xml description does not contain information about
    - Detector element structure
    - Sensitive element information
- Most, but not all subdetectors converted

DD4Hep - The Big Picture



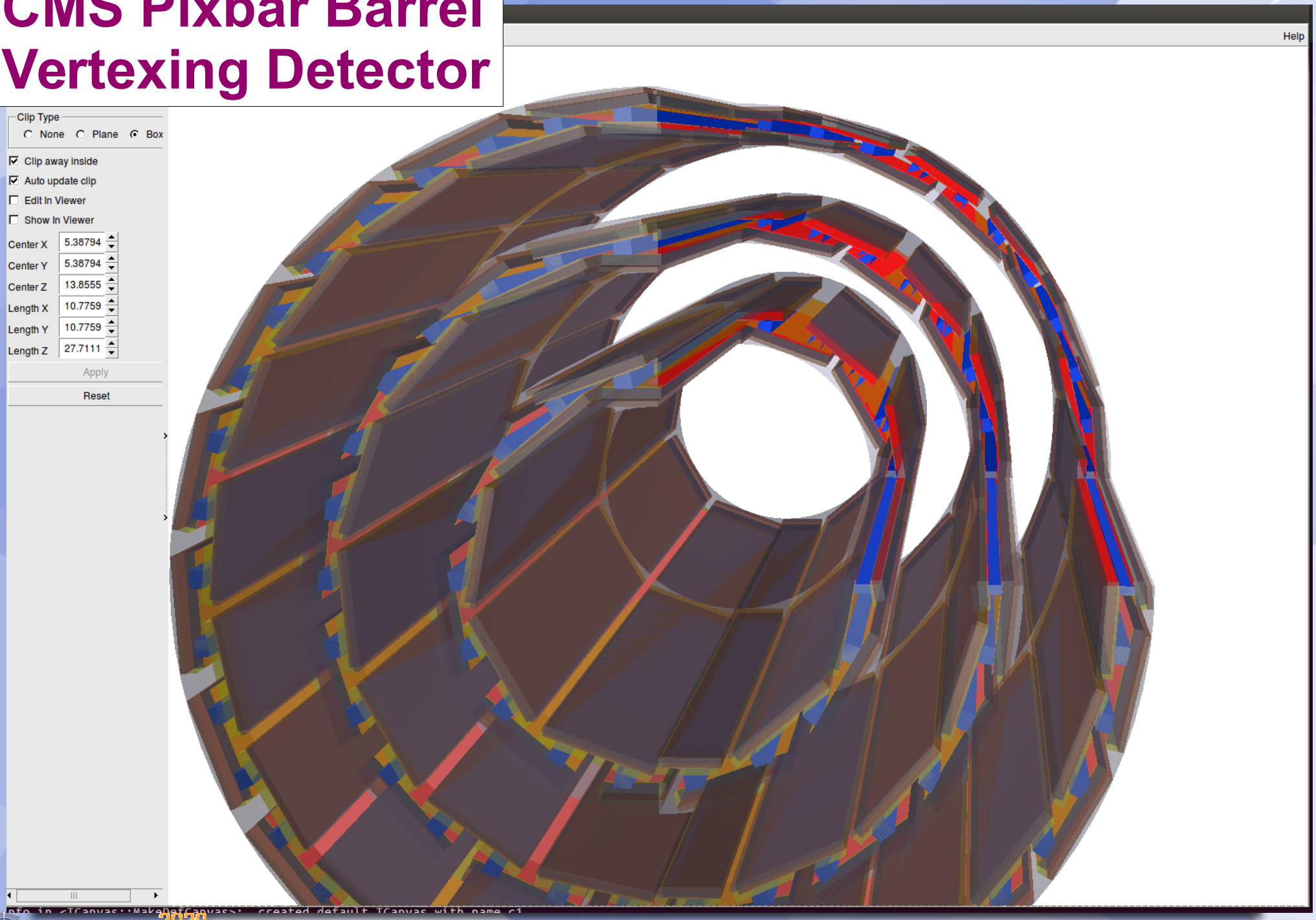
Multiple Input Sources to DD4hep



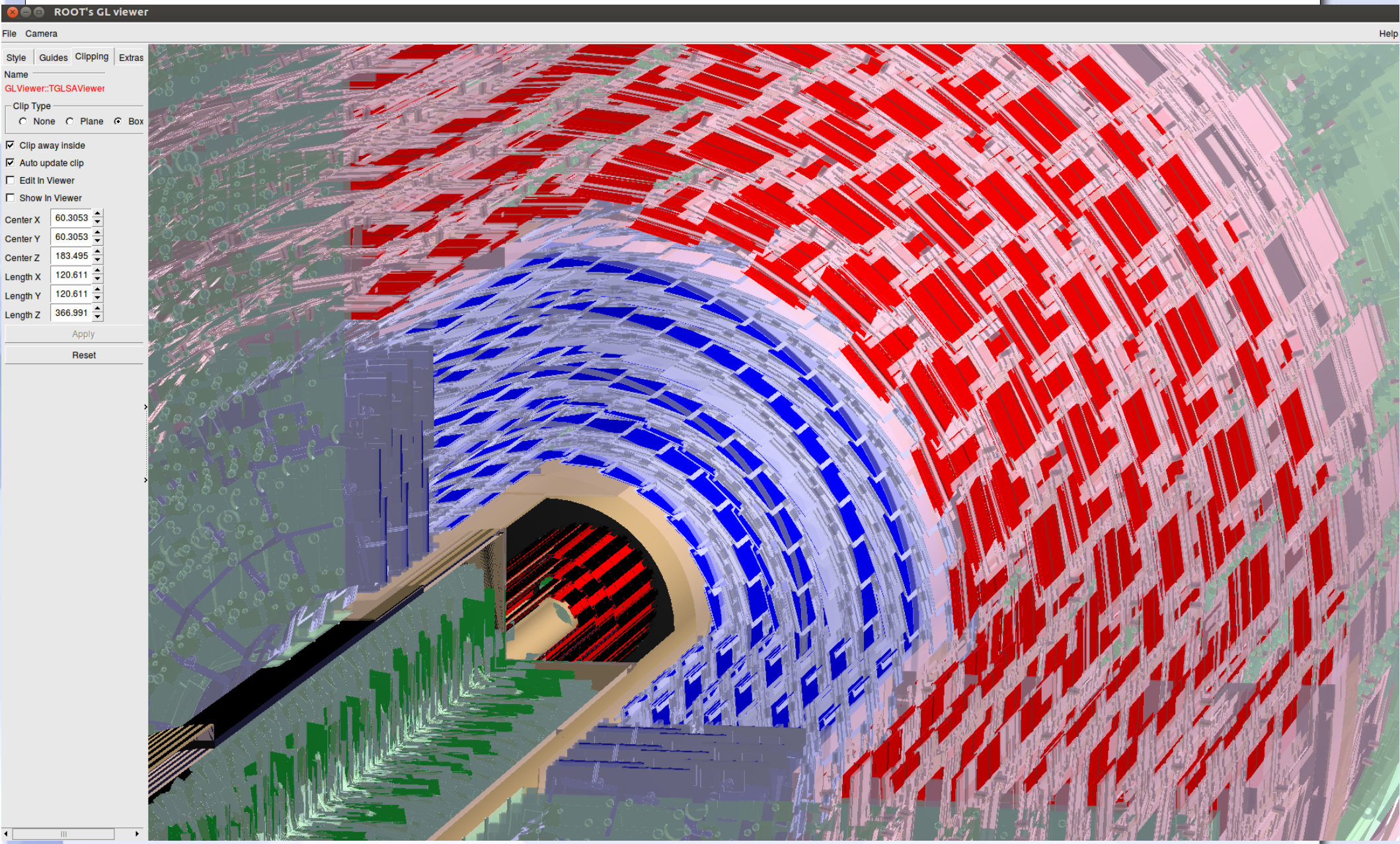
Additional Modules

- Color encoding for display
  - Default colors look ugly
- Geant4 Simulation
  - Not so smooth: had to disable some elements
    - Geant4 detected overlaps and bailed out
    - Still most of the barrel present
  - Definition of sensitive elements
    - Not present in CMS xml
    - Simply define:
      - if (Si fraction in material) > 0.9:
        1) volume is sensitive
        2) attach default sensitive detector

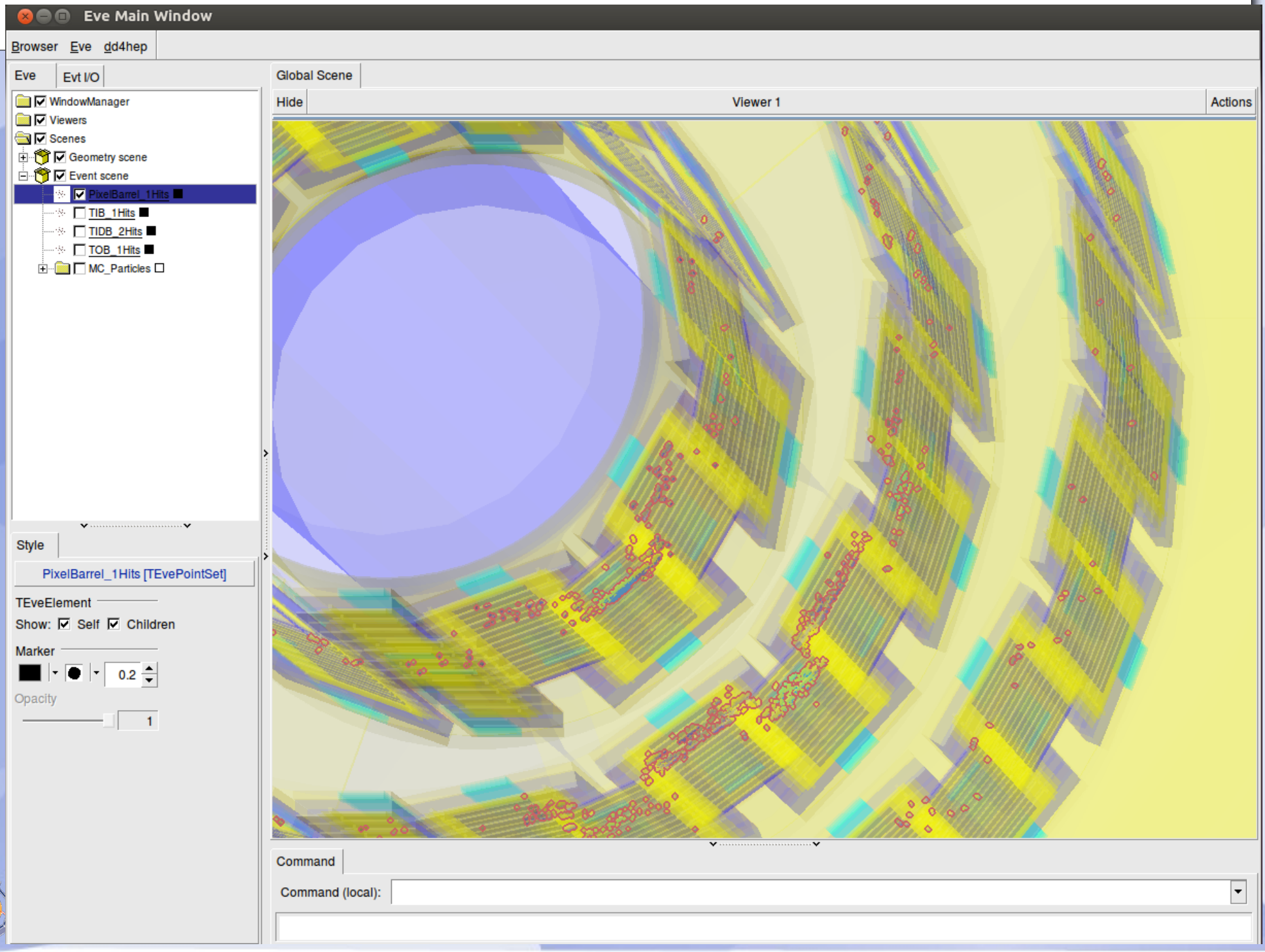
CMS Pixbar Barrel Vertexing Detector



CMS Tracker


ROOT's GL viewer
File
Camera
Help
Style
Guides
Clipping
Extras
Name
GLViewer::TGLSAViewer
Clip Type
None
Plane
Box
Clip away inside
Auto update clip
Edit In Viewer
Show In Viewer
Center X
60.3053
Center Y
60.3053
Center Z
183.495
Length X
120.611
Length Y
120.611
Length Z
366.991
Apply
Reset

CMS Tracker: Simulated with DDG4



Conclusions

- It would be great if CMS would be a new customer
- It was relatively simple to adopt a new geometry population mechanisms
  - Mainly depends on the complication of the underlying xml model
  - CMS was painless:
    CMS uses already similar approach as compact:
    - XML fragments together with code plugins
- Next steps
  - See how Geant4 simulation behaves