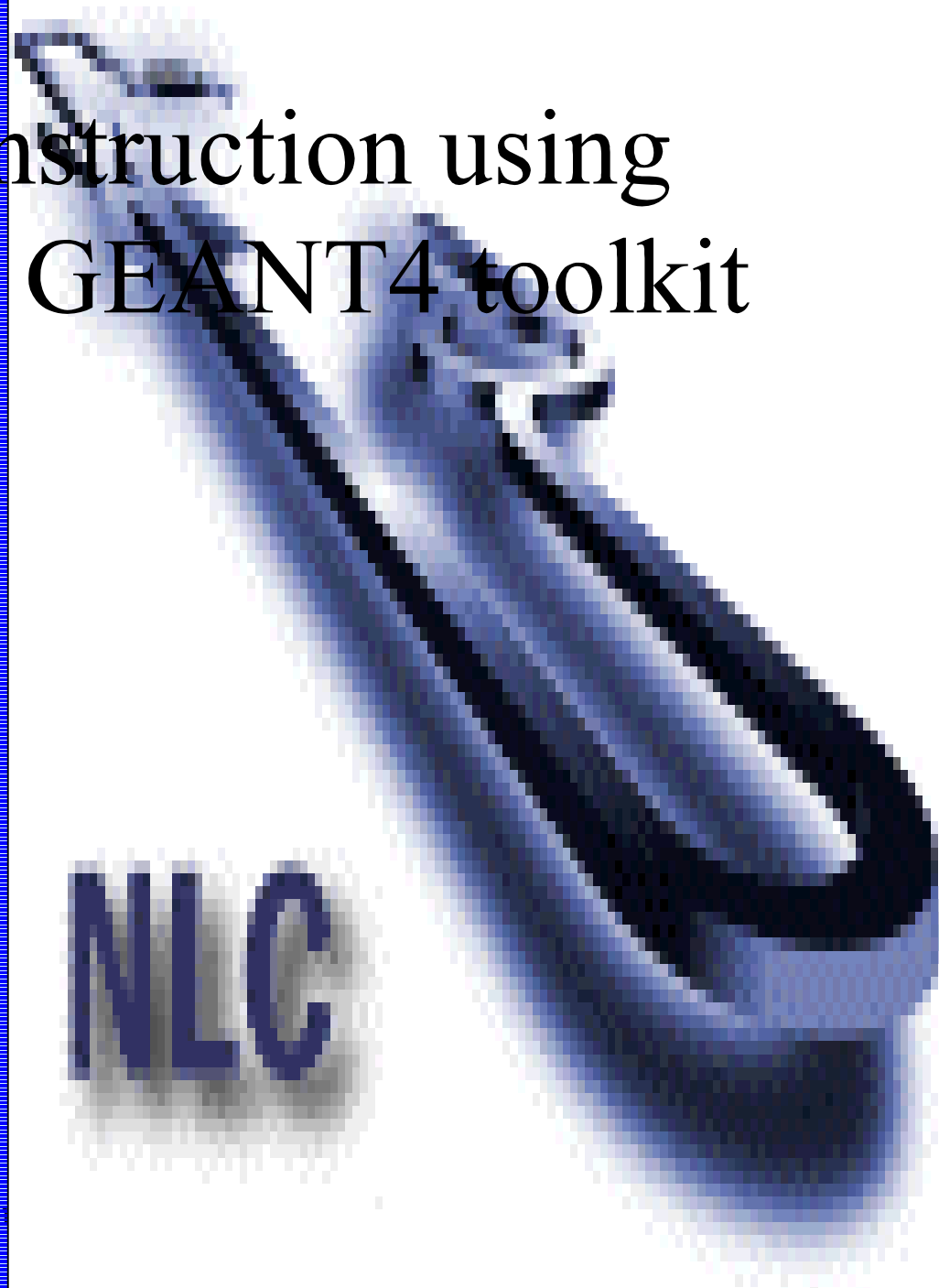
Detector Construction using XML with the GEANT4 toolkit

By Ryan Smith and Norman Graf

Developing on Linux and Visual Studio on NT

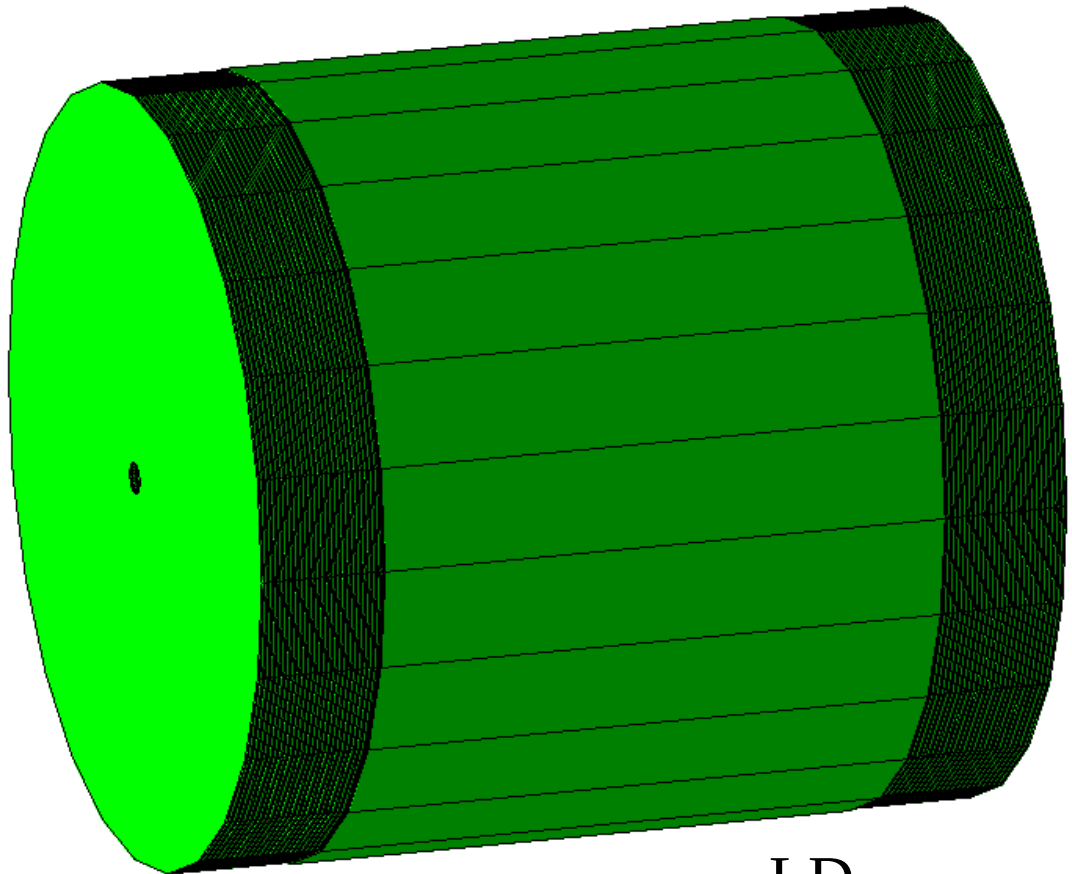


About me

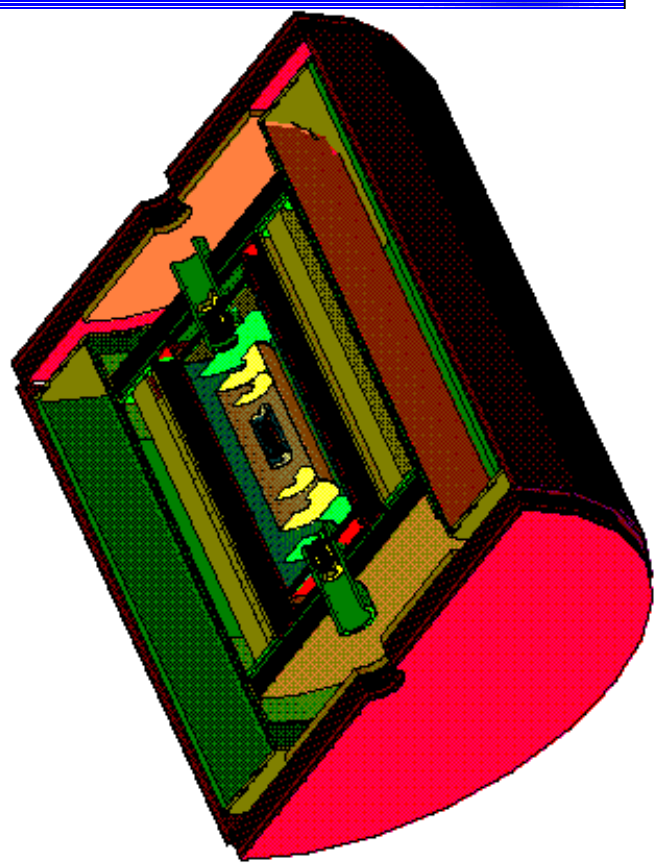
- Undergrad degree at the University of Victoria (physics co-op) Canada
- Previous internships at:
  - DKFZ, Heidelberg
  - CREO Products Inc.
  - Hawaiian Volcano Observatory
  - Pacific Geoscience Centre

Collaboration

- GLAST: keeping up with Joanne Bogart's development using XML for detector construction
- BABAR: will be working with William Lockman and David Williams on implementing their Geant4 sensitive detector and tracking code.



LD



Hurdles

- Only able to visualize on NT in the last few weeks, after 3 months running smoothly on Linux
- Volume hierarchy - generating all layers takes hours. To be improved …

PDMar01.eps - GSview

File Edit Options View Orientation Media Help

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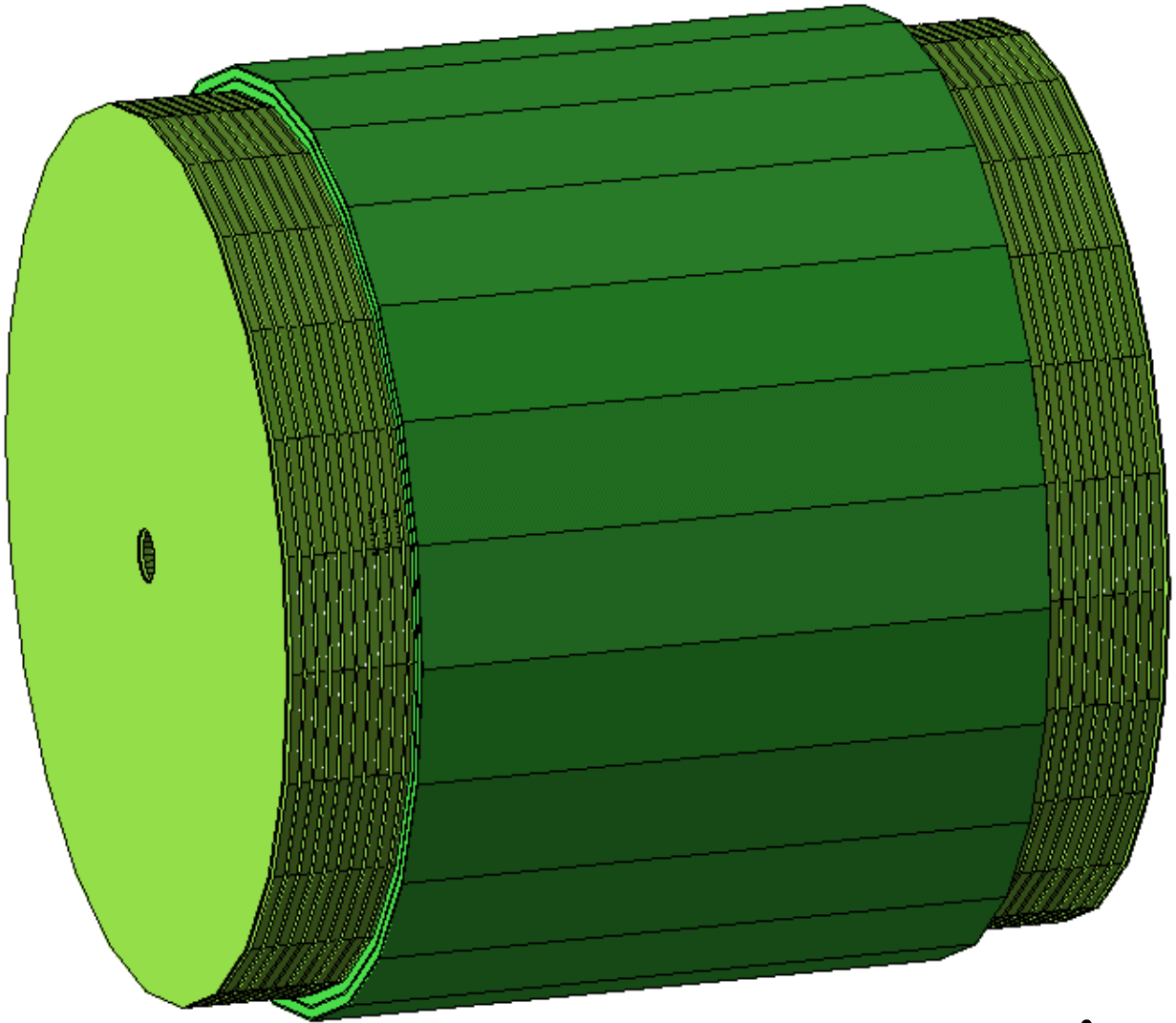
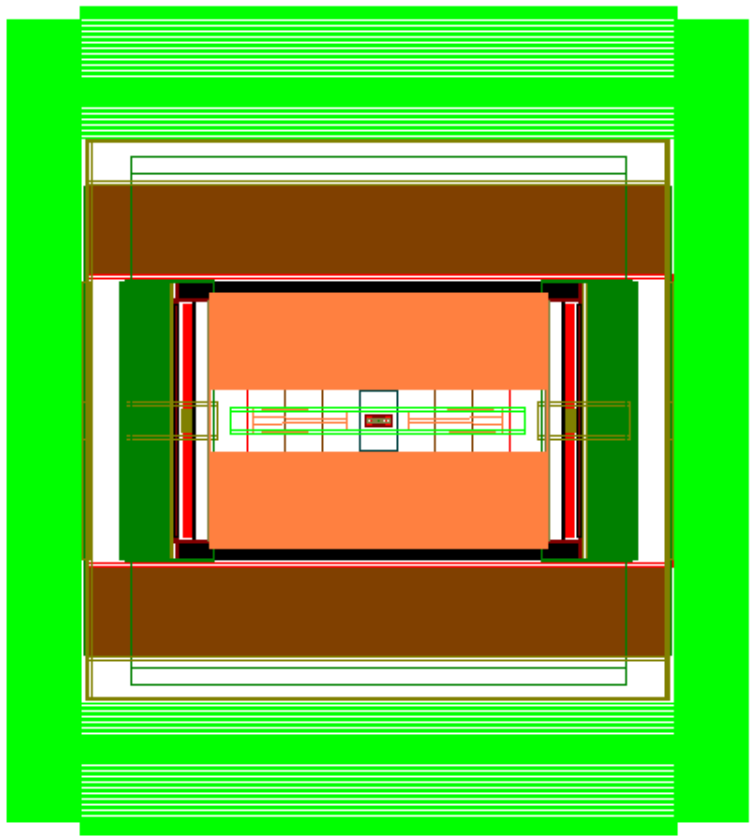


Precise

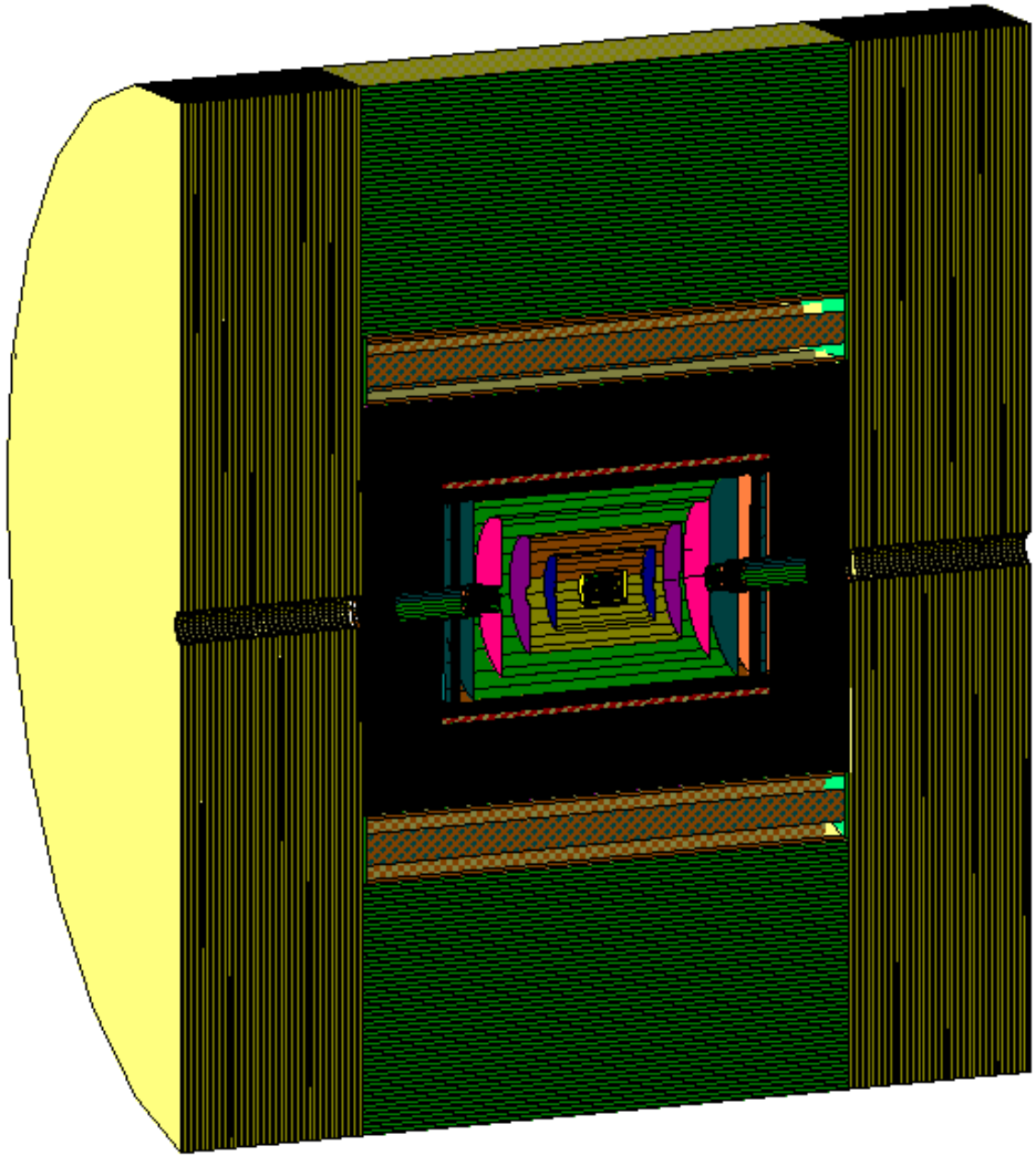
Detector Construction using GEANT4



Usability:

- Many different pieces to generate ps files on NT : Tcl/Tk, DAWN, Dawncut, CMT, Cygwin, OpenGL, MS Visual Studio, Xerces

Silicon



PDMar01xCut.eps - GSview

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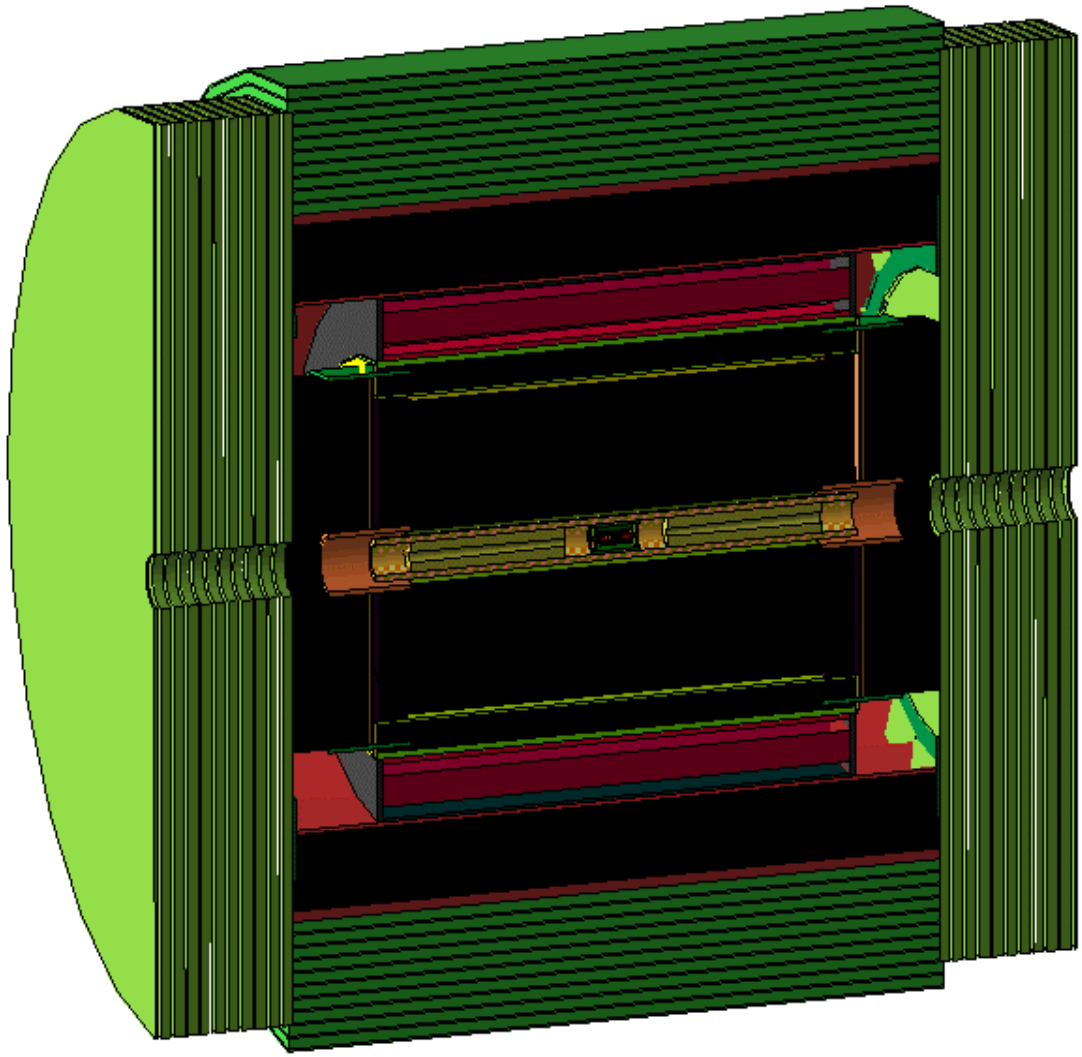
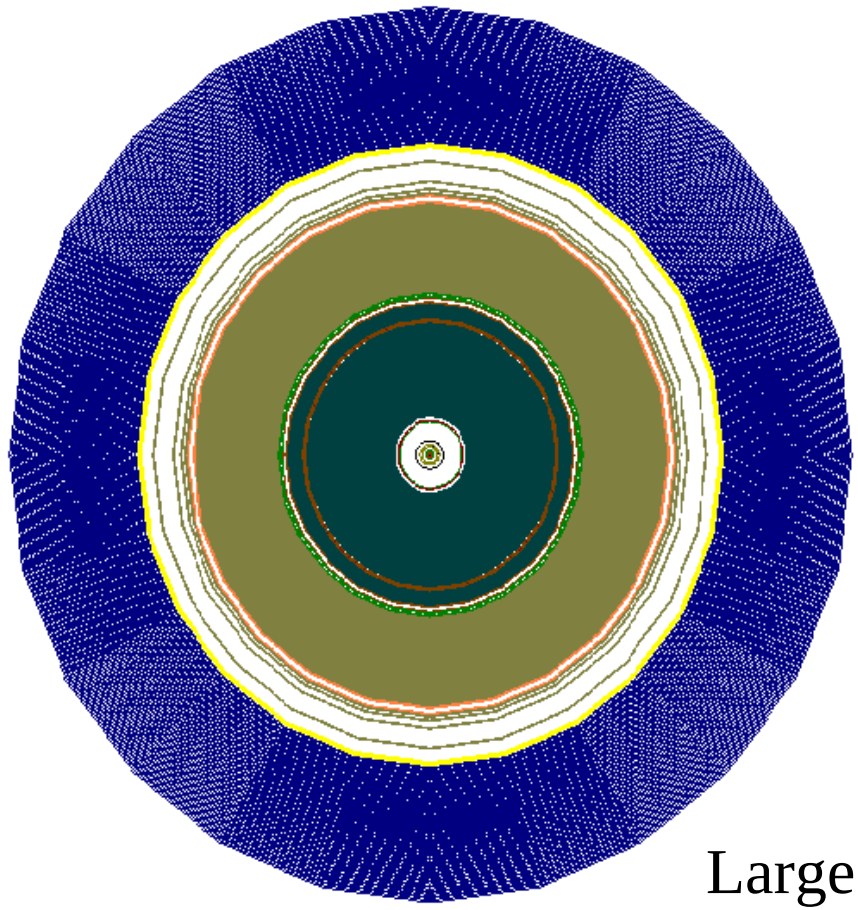


Precise

Present Status:

- Using Xerces DOM parser on xml files
- LCD code from GismoApps to calculate dimensions of cones, disks and tubes
- Implementing it in a Geant4 novice example
- Recently set-up sensitive detector elements and generated hits



Large Detector

wireL2full2.eps - GSview

File Edit Options View Orientation Media Help

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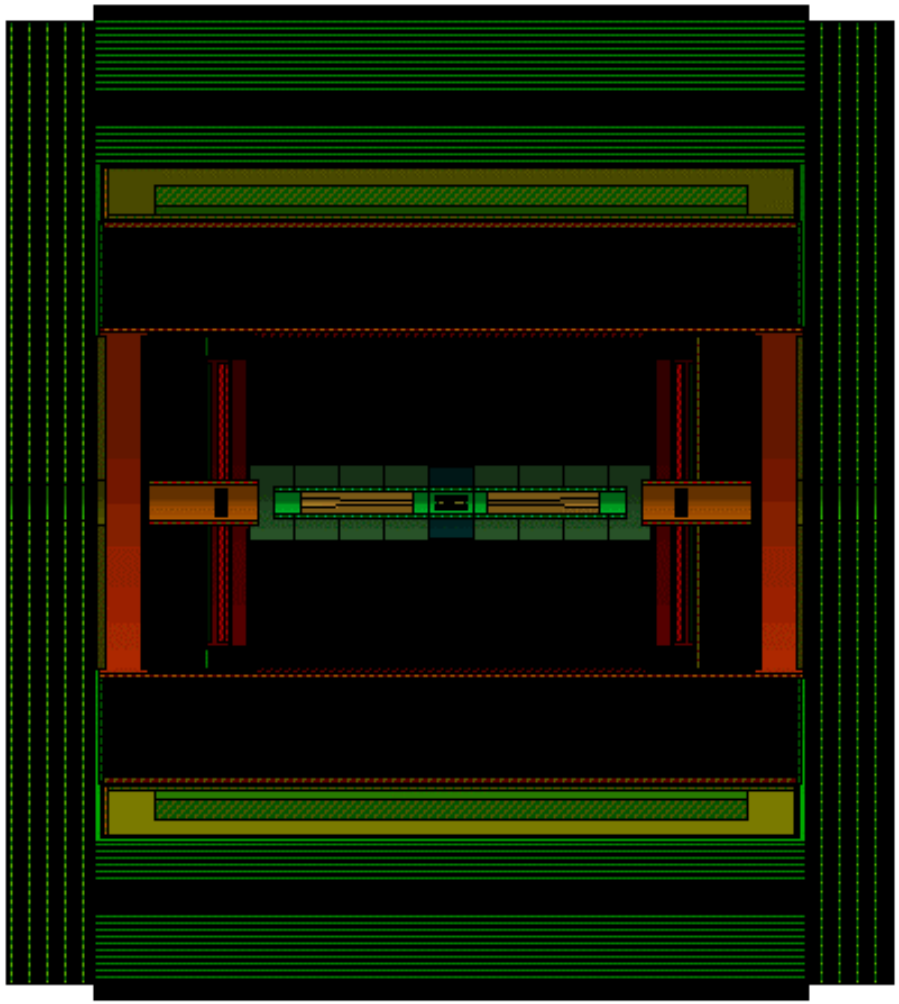
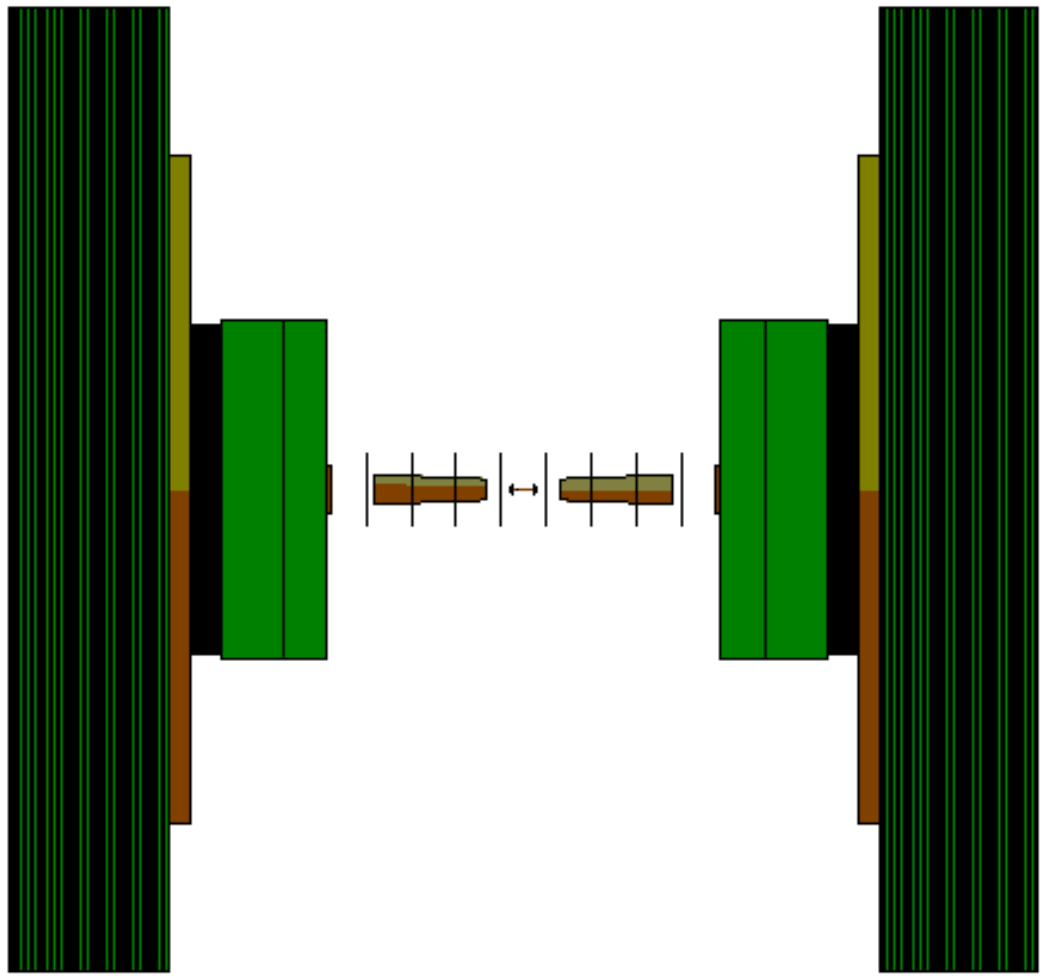


The Large Detector

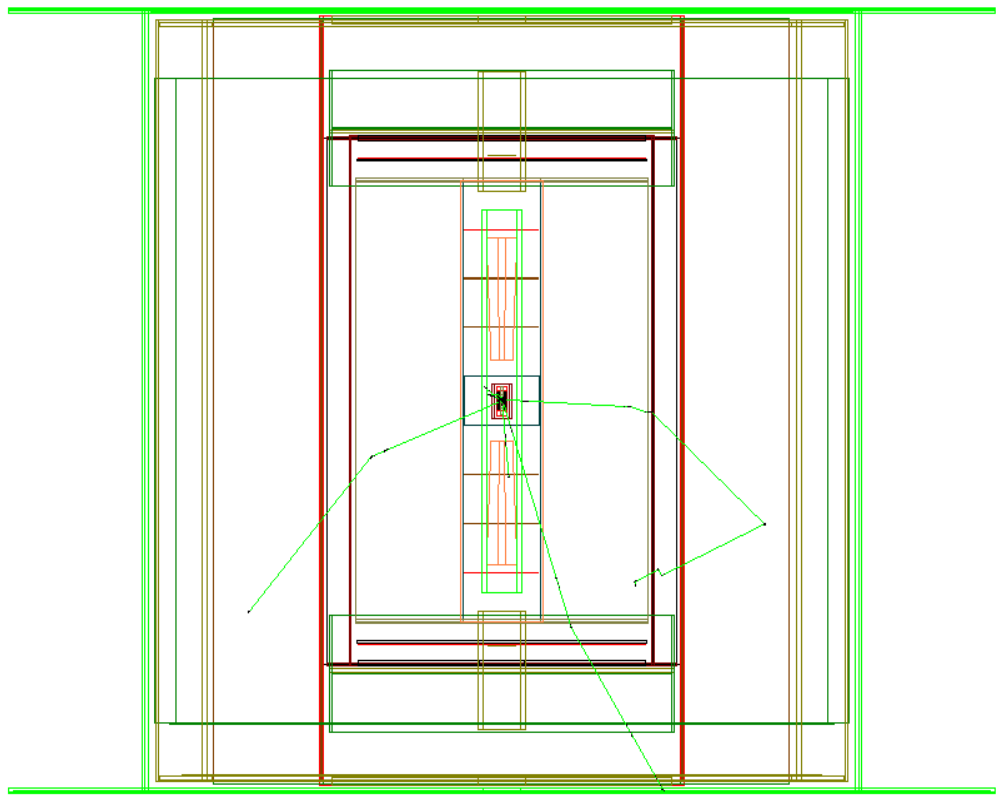
Future goal

- To have a fully operational simulation using Geant4 with the XML file as an argument



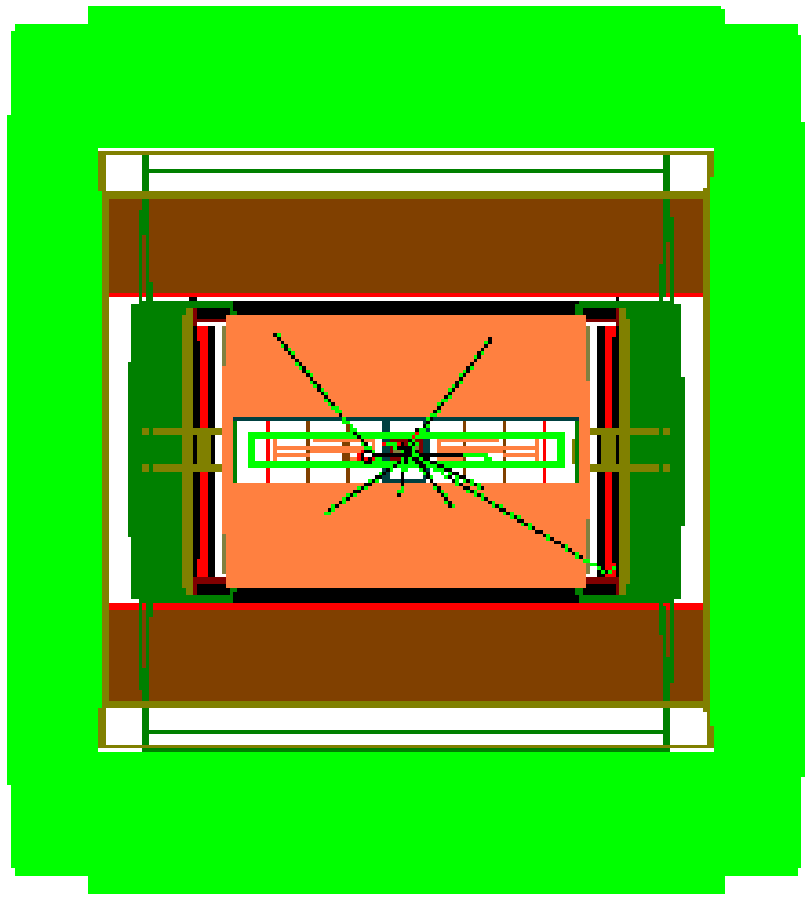
Visualization options

Wireframe,
One layer per volume



Visualization options

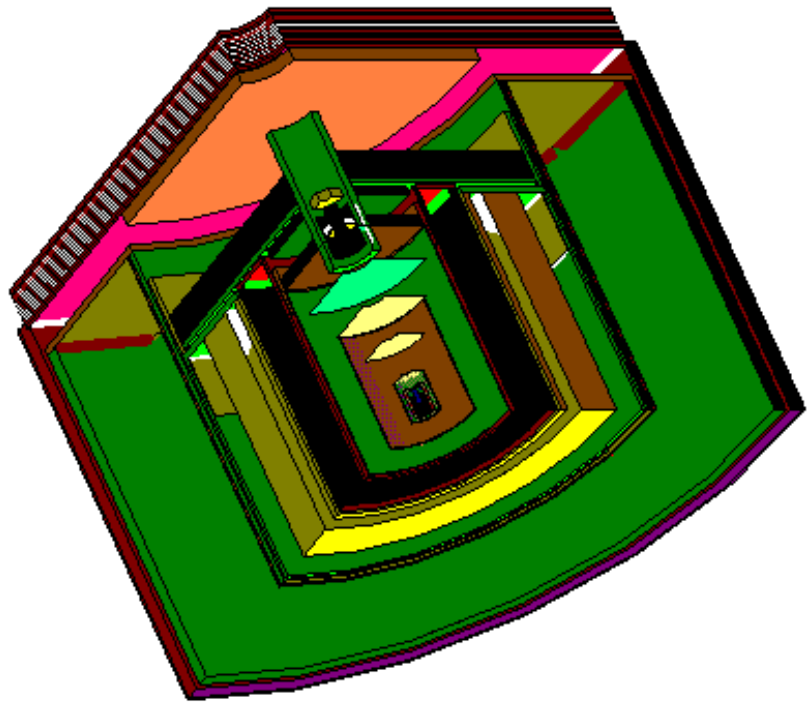
Wireframe,
All layers



Visualization options

Surface rendering

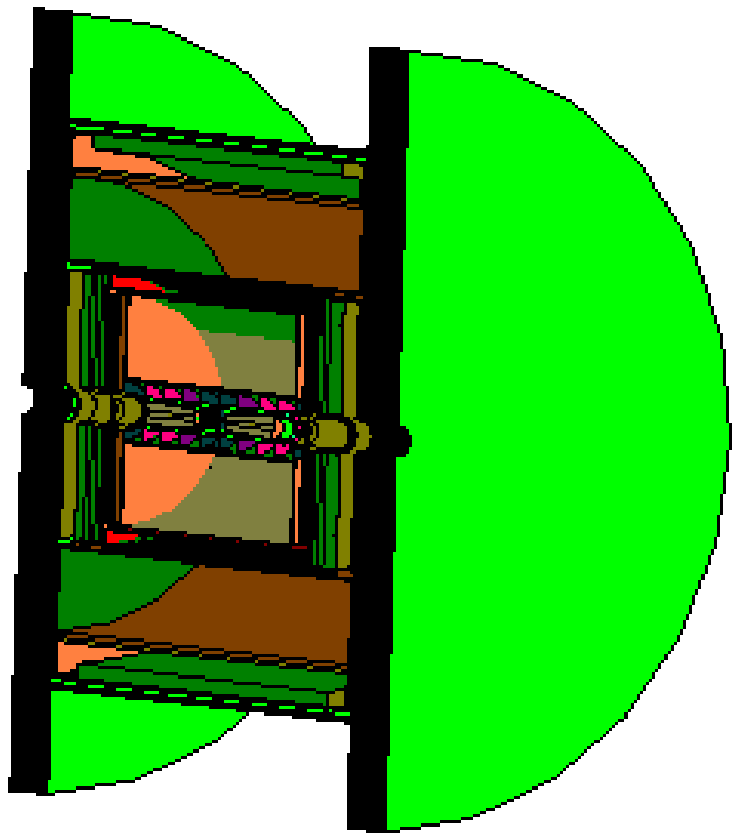
Quarter cut



Visualization options

Surface rendering

Half cut



Summary

- XML files being parsed, detector construction functional on Geant4
- Simple events generated
- To do next is get fully functional hits and tracking