

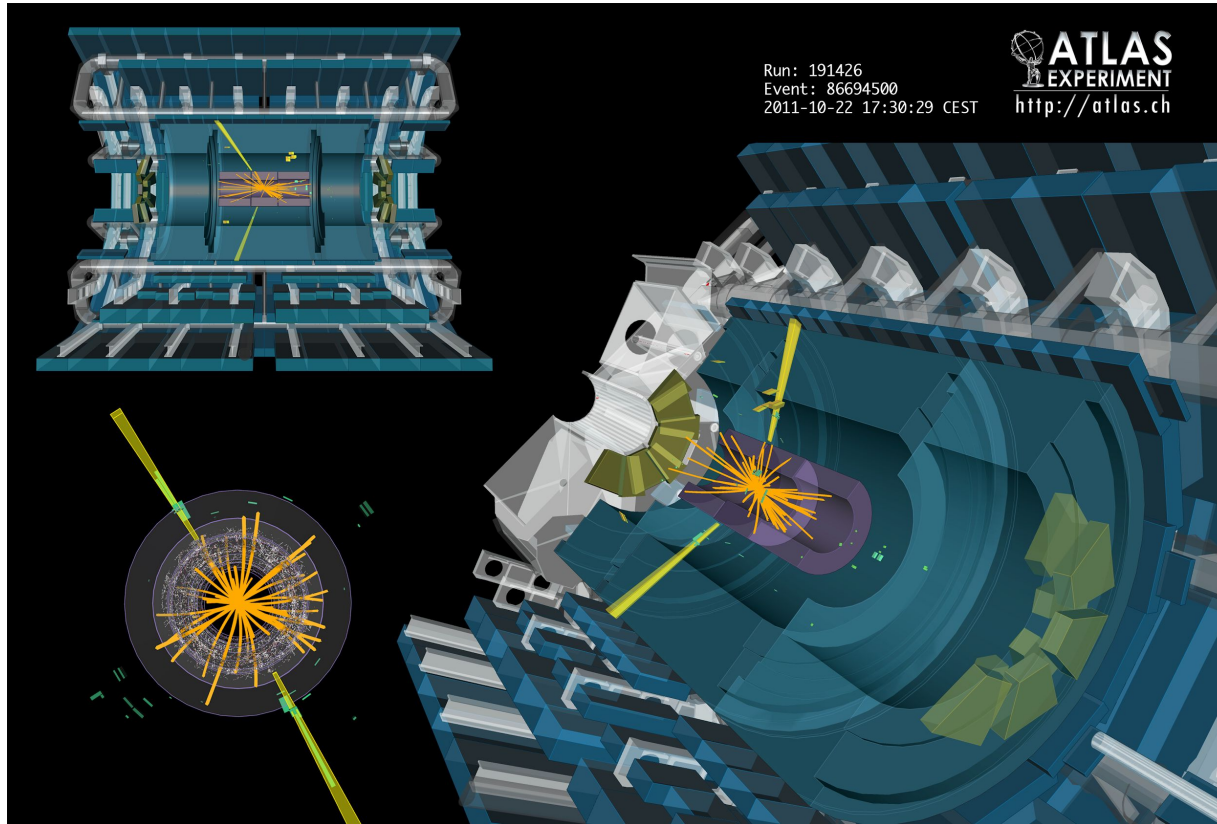


# **GeoExaminerViewer:** **interactive 3D geometry visualization for HEP detector**

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# Visualisation is important for Physics



Already built tools:

Virtual Point(VP1)

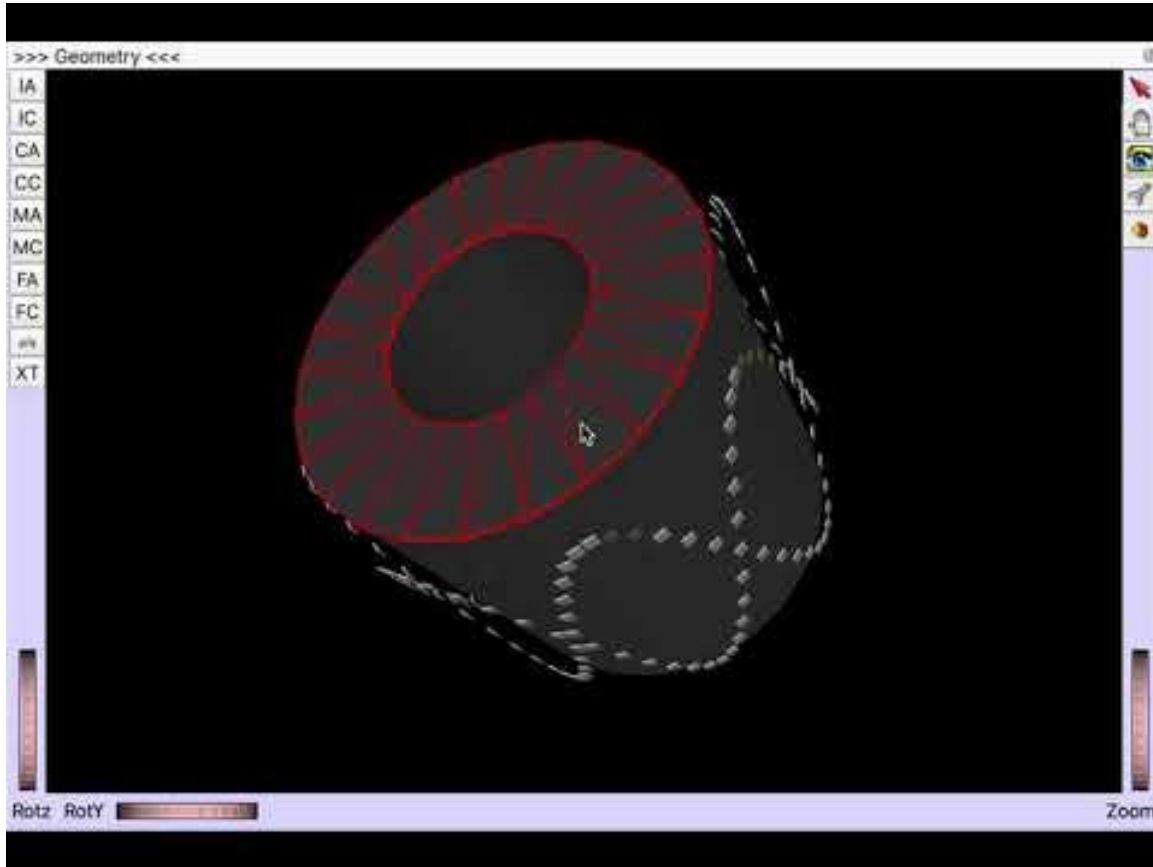
VP 1 Light

GeoModelExplorer

...

∈ Athena visualisation tools

# What can previous viewer do?



*Give user interactive exploring experience*

View/Camera:

Focus on clicked point

Animated Tours

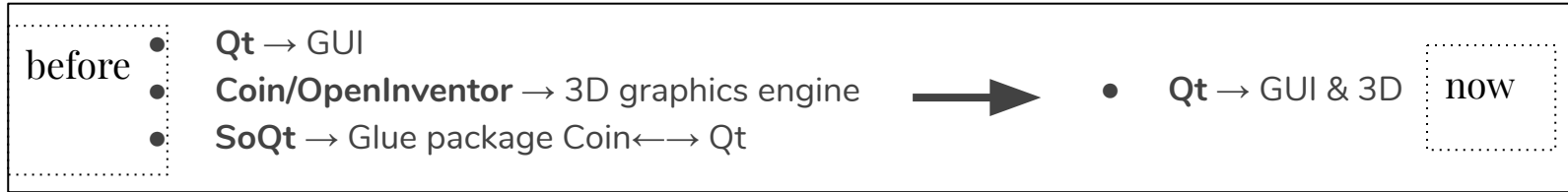
Volume/Geometry:

Picking/selection,

Hide volume, show its children components

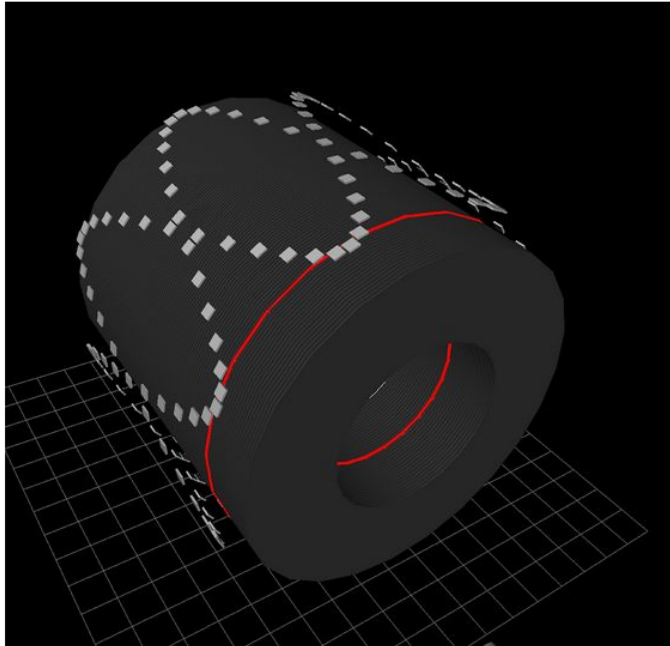
# Why to build a new one?

Use a single framework, Qt, for everything

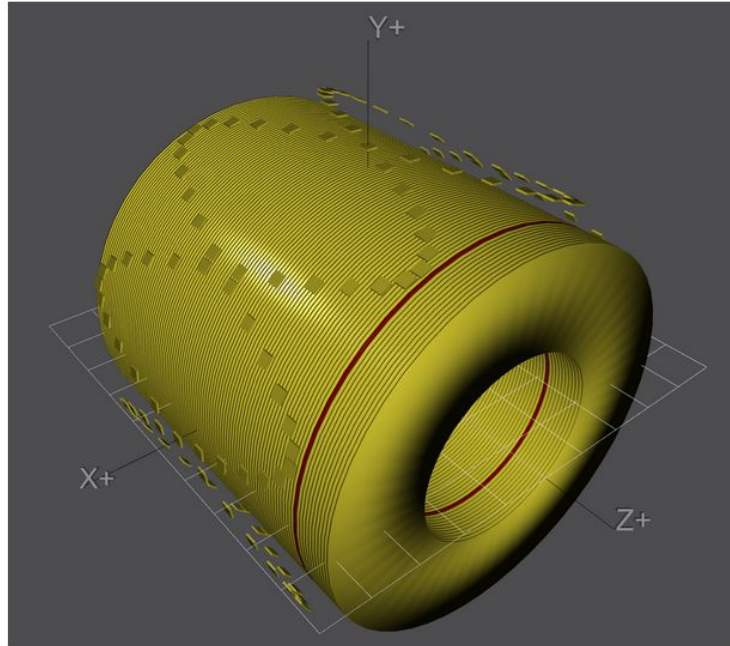


- By adopting Qt3D we would **reduce maintenance** work and **simplify** our graphics pipeline
- It would **assure more general support** and development, being Qt one of the most used C++ frameworks in all types of projects, both open-source and commercial
- **HOWEVER**, many high-level functionalities are missed in Qt3D, compared to Coin3D.

# Is the new viewer ok? Loader&builder:



GeoModelExplorer(previous work)



GeoExaminerViewer(my work)

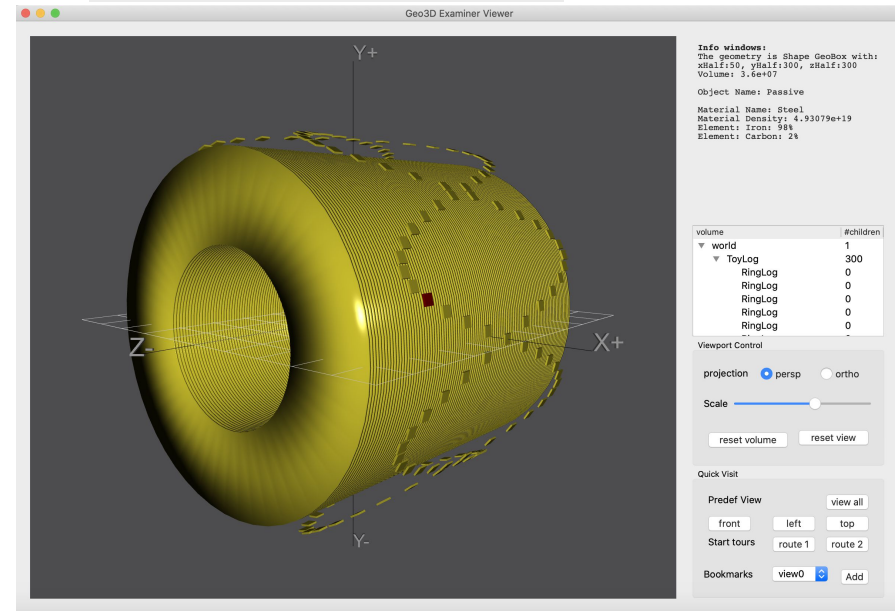
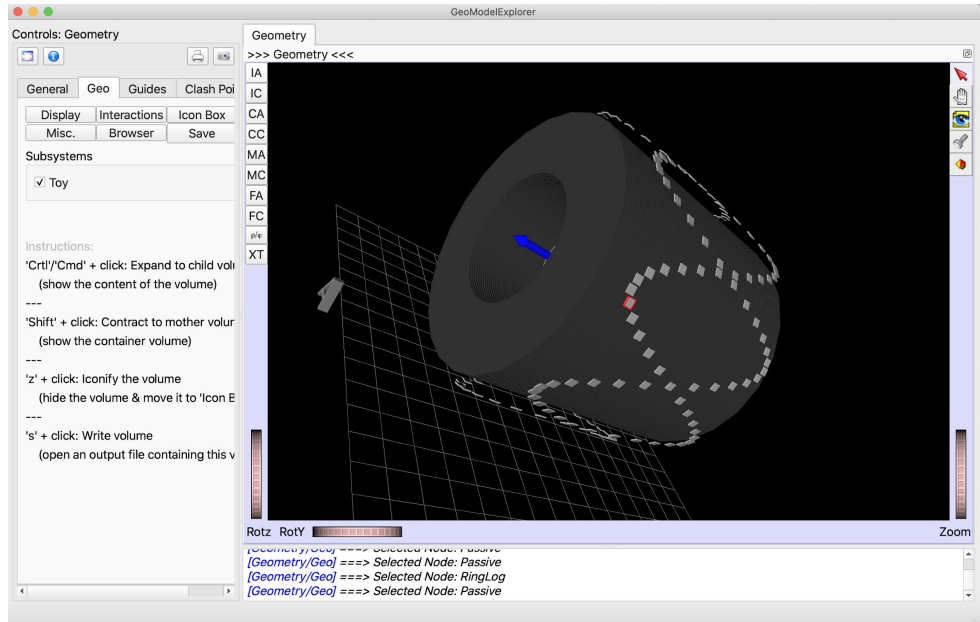
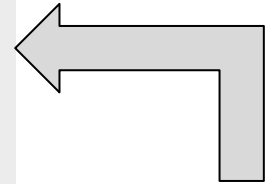
Successfully  
built Volumes  
by reading  
geometry  
parameters  
from same  
SQLite  
database

# Is the new viewer ok? UI:

**Info windows:**  
The geometry is Shape GeoTube with:  
rMin:5000, rMax:10000, zHalf:50  
Volume: 2.35619e+10

Object Name: RingLog

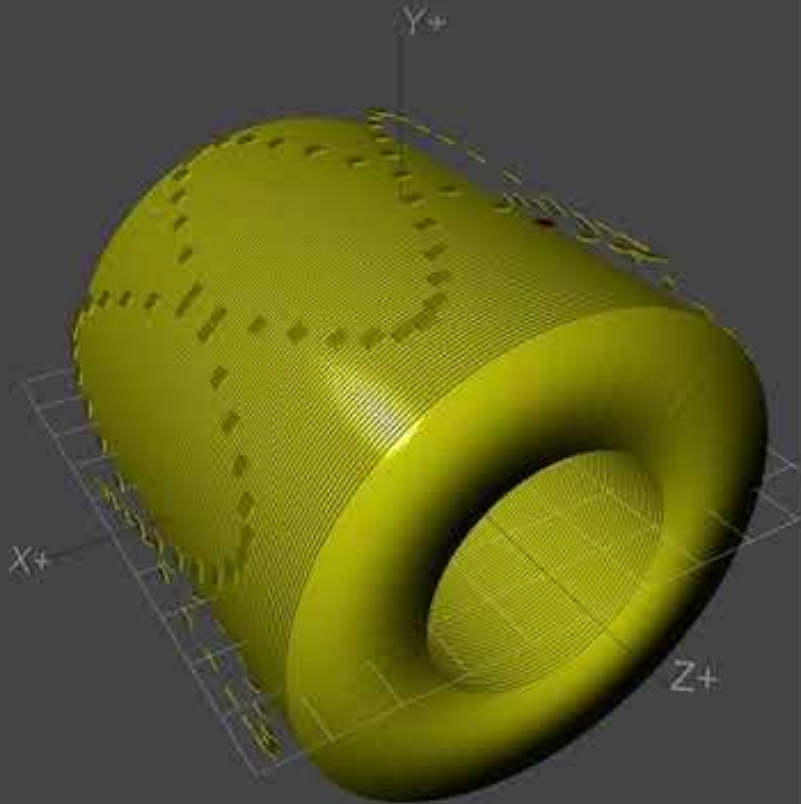
Material Name: Carbon  
Material Density: 1.45365e+19  
Element: Carbon: 100%



The original viewer, showing the content of the *Step6\_ToyDetectorGeometry.db* file.

The new viewer, developed in the context of this project, showing the same detector geometry.

# Is the new viewer ok? functionality:



## List of Features:

1. Picking/selection, deselection
2. Open and close volume
3. Focus on clicked points/volume
4. Switch projective type
5. Three Predefined views: Left, top, front view
6. Bookmark custom views
7. Volume trees
8. Info windows
9. Mesh sharing between volumes

developing...

# Thanks !

Google Summer of Code 2020 - [Development of a visualization tool to interactively explore the geometry of a HEP detector](#)

[CERN-HSF community](#) - [ATLAS experiment group](#)

Github repository : <https://github.com/HSF/Ot3DExaminerViewer>

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