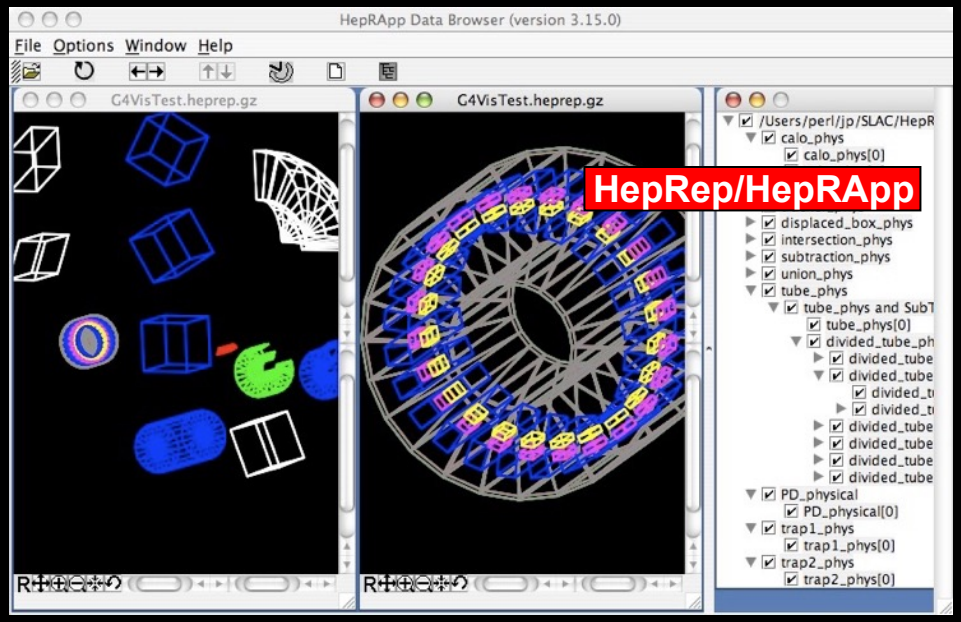
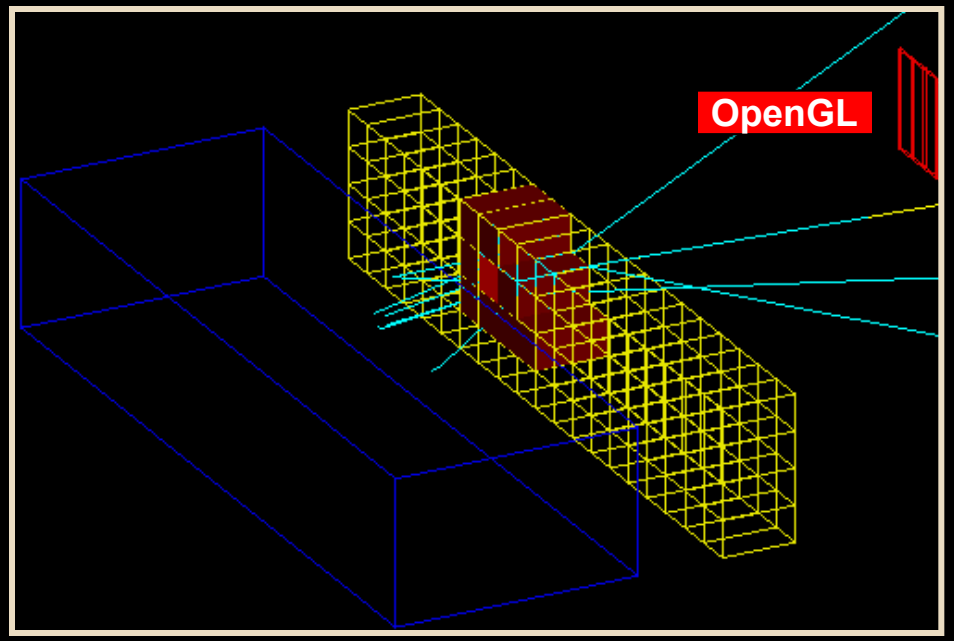
Geant4 release 10.5

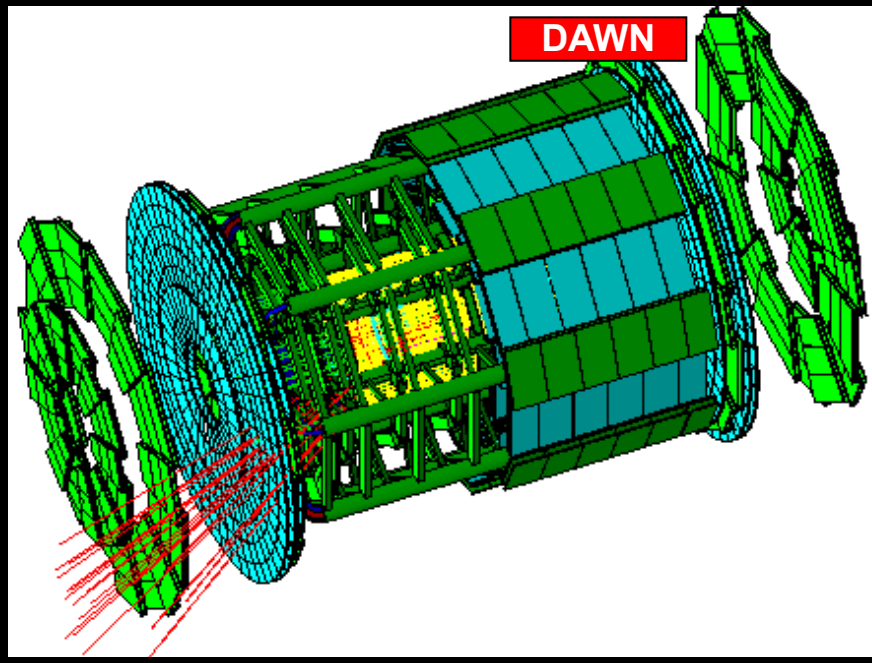
VISUALIZATION

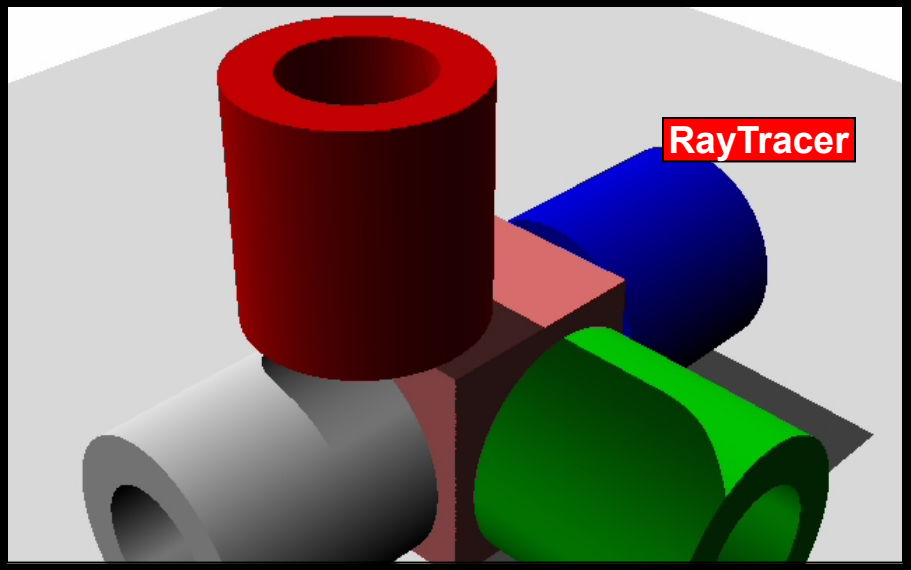
Mihaly Novak
based on material provided by
M. Asai (SLAC) & A. Dotti (SLAC) & J. Perl (SLAC) & L. Garnier (CNRS)

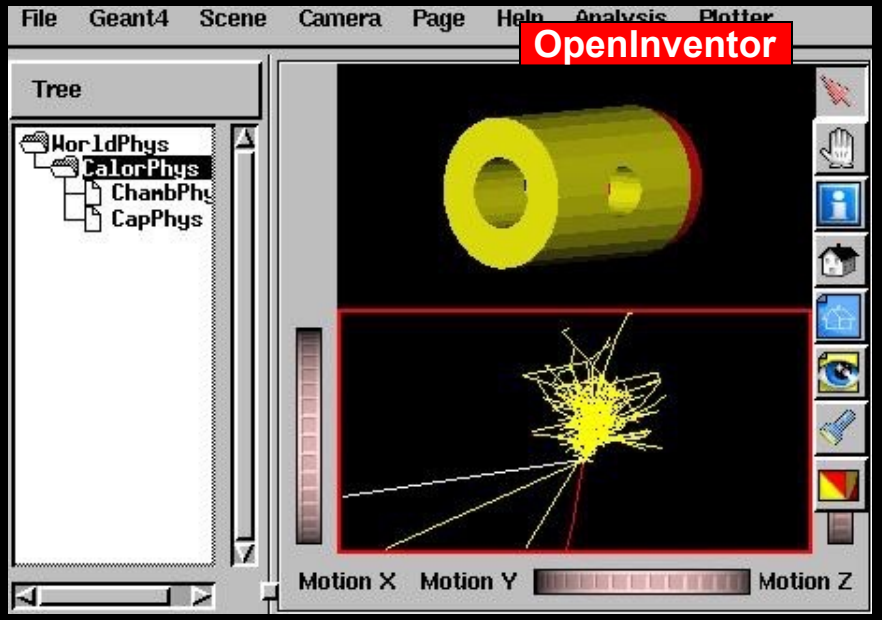
Instituto de Física da Universidade de São Paulo
4-8 February 2019

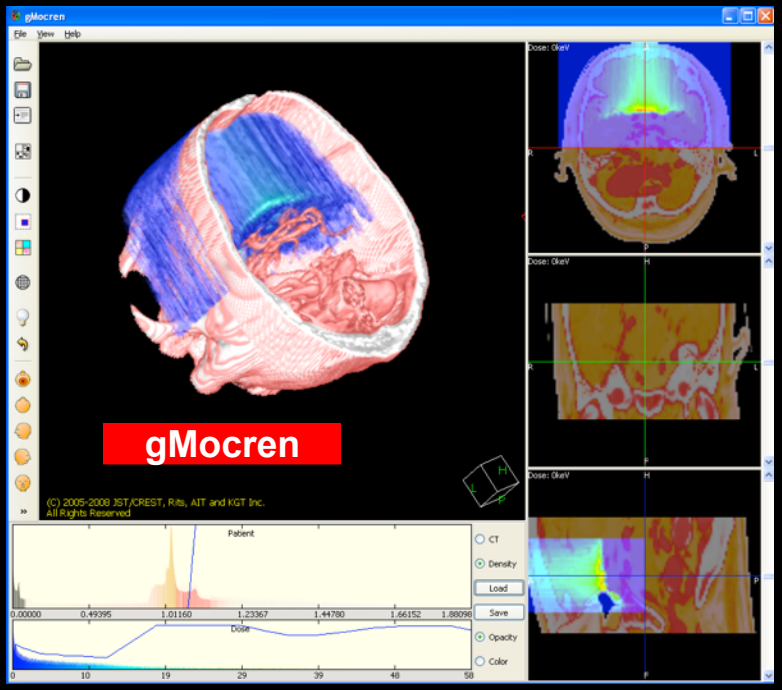

HepRApp Data Browser (version 3.15.0)
File Options Window Help
G4VisTest.heprep.gz
G4VisTest.heprep.gz
HepRep/HepRApp
/Users/perl/jp/SLAC/HepR
calo_phys
calo_phys[0]
displaced_box_phys
intersection_phys
subtraction_phys
union_phys
tube_phys
tube_phys and SubT
tube_phys[0]
divided_tube_ph
divided_tube
divided_tube
divided_tube
divided_tube
divided_tube
divided_tube
divided_tube
PD_physical
PD_physical[0]
trap1_phys
trap1_phys[0]
trap2_phys
trap2_phys[0]

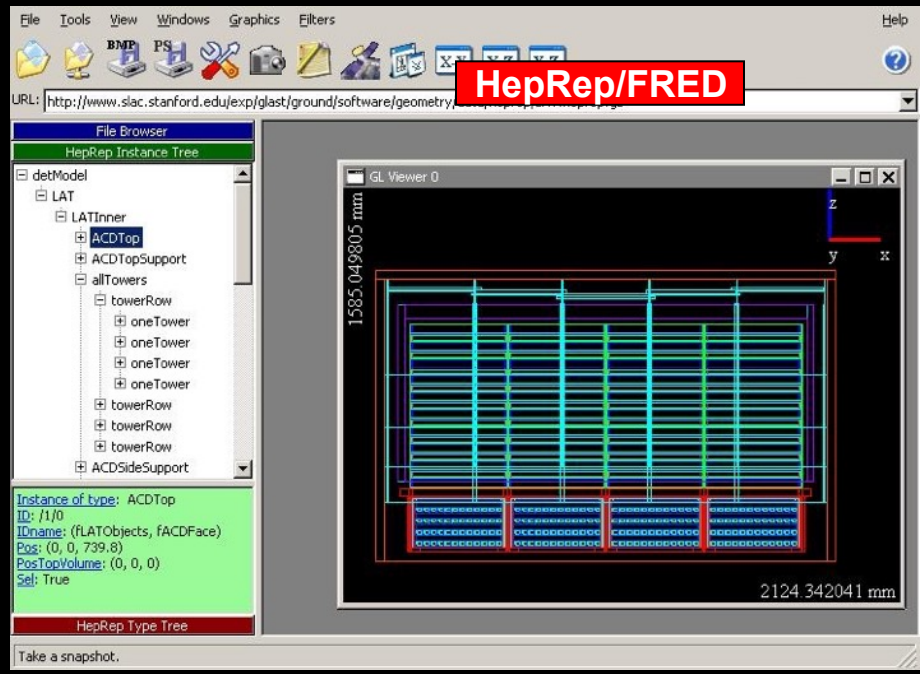

OpenGL

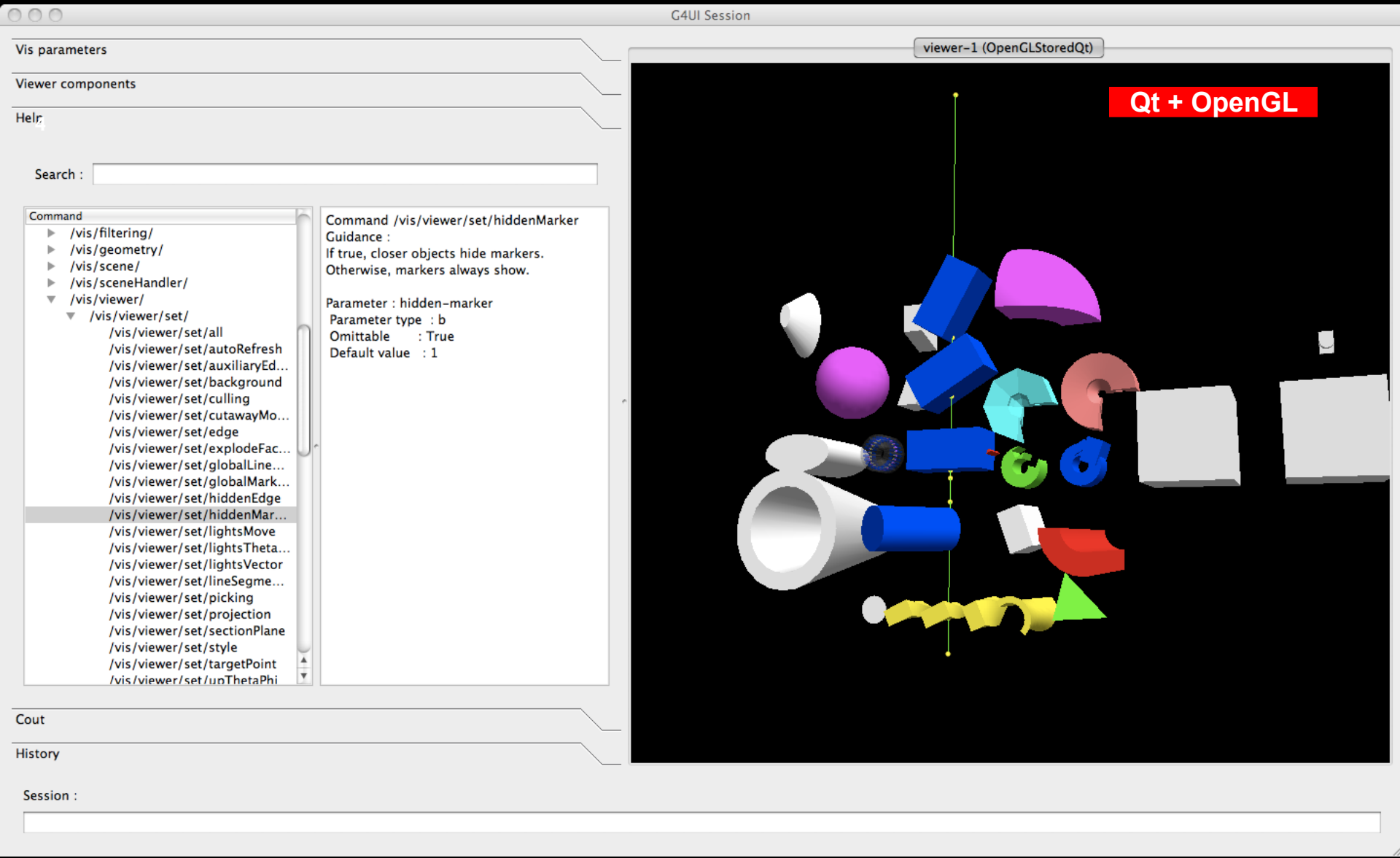

DAWN


RayTracer


File
Geant4
Scene
Camera
Page
Help
Analysis
Plotter
OpenInventor
Tree
WorldPhys
CalorPhys
ChambPhy
CapPhys
Motion X
Motion Y
Motion Z


gMocren
File
View
Help
(C) 2005-2008 JST/CREST, Rits, AIT and KGT Inc.
All Rights Reserved
Patient
Dose
CT
Density
Load
Save
Opacity
Color


File
Tools
View
Windows
Graphics
Filters
Help
BMP
PS
HepRep/FRED
URL: http://www.slac.stanford.edu/exp/glast/ground/software/geometry
File Browser
HepRep Instance Tree
detModel
LAT
LATInner
ACDTop
ACDTopSupport
allTowers
towerRow
oneTower
oneTower
oneTower
oneTower
towerRow
towerRow
towerRow
ACDSideSupport
Instance of type: ACDTop
ID: /1/0
IDname: (fLATObjects, fACDFace)
Pos: (0, 0, 739.8)
PosTopVolume: (0, 0, 0)
Sel: True
HepRep Type Tree
GL Viewer 0
1585.049805 mm
2124.342041 mm
Take a snapshot.


G4UI Session
Vis parameters
Viewer components
Help
Search :
Command
/vis/filtering/
/vis/geometry/
/vis/scene/
/vis/sceneHandler/
/vis/viewer/
/vis/viewer/set/
/vis/viewer/set/all
/vis/viewer/set/autoRefresh
/vis/viewer/set/auxiliaryEd...
/vis/viewer/set/background
/vis/viewer/set/culling
/vis/viewer/set/cutawayMo...
/vis/viewer/set/edge
/vis/viewer/set/explodeFac...
/vis/viewer/set/globalLine...
/vis/viewer/set/globalMark...
/vis/viewer/set/hiddenEdge
/vis/viewer/set/hiddenMar...
/vis/viewer/set/lightsMove
/vis/viewer/set/lightsTheta...
/vis/viewer/set/lightsVector
/vis/viewer/set/lineSegme...
/vis/viewer/set/picking
/vis/viewer/set/projection
/vis/viewer/set/sectionPlane
/vis/viewer/set/style
/vis/viewer/set/targetPoint
/vis/viewer/set/upThetaPhi
Command /vis/viewer/set/hiddenMarker
Guidance :
If true, closer objects hide markers.
Otherwise, markers always show.
Parameter : hidden-marker
Parameter type : b
Omittable : True
Default value : 1
Cout
History
Session :
viewer-1 (OpenGLStoredQt)
Qt + OpenGL

What can be visualized ?

- Simulation data can be visualized
  - Geometrical components
  - Particle trajectories and tracking steps
  - Hits of particles in the geometry
  - Scored energy, dose, etc.

- Other user defined objects can be visualized
  - Polylines
    - such as coordinate axes
  - 3D Markers
    - such as eye guides
  - Text
    - descriptive character strings
    - comments or titles
- Geant4 visualisation documentation: **Visualisation Documentation**

A variety of choices

Driver	Variant	Hight quality print	Interactive	browse geometry hierarchies	Direct access to G4 kernel	Make movies	Web
OpenGL	X						
	Xm						
	Qt						
	Win32						
OpenInventor	Xt						
	Win32						
DAWN							
VRML							
HepRep							
gMocren							
RayTracer							
ACSII File							

Comput. Phys. Comm. 178 (2008) 331-365

Controlling visualization

- Your Geant4 code stays basically the same no matter which driver you use
- Visualization is performed either with commands or from C++ code
  - For the present tutorial, we confine ourselves to command-driven visualization.
- Some visualization drivers work directly from Geant4
  - OpenGL
  - OpenInventor
  - RayTracer
  - ASCIITree
- For other visualization drivers, you first have Geant4 produce a file,
  and then you have that file rendered by another application (which may have GUI control)
  - HepRepFile
  - DAWNFILE
  - VRML2FILE
  - gMocrenFile
- You can open more than one driver at a time
  - For example, do a quick check in OpenGL,
    then save the same event for a beautiful DAWN plot

Controlling which drivers are available

- Six of the visualization drivers are always included by default (since they require no external libraries):
  - HepRepFile
  - DAWNFILE
  - VRMLFILE
  - RayTracer
  - gMocrenFile
  - ASCIITree

- Other visualization drivers are included only if you request them in your cmake options.

- You can also add your own visualization driver
  - Geant4's visualization system is modular.
    By creating just three new classes, you can direct Geant4 information to your own visualization system.

Simplest command example

- Visualize your geometry in OpenGL
  - /vis/open OGL
  - /vis/drawVolume

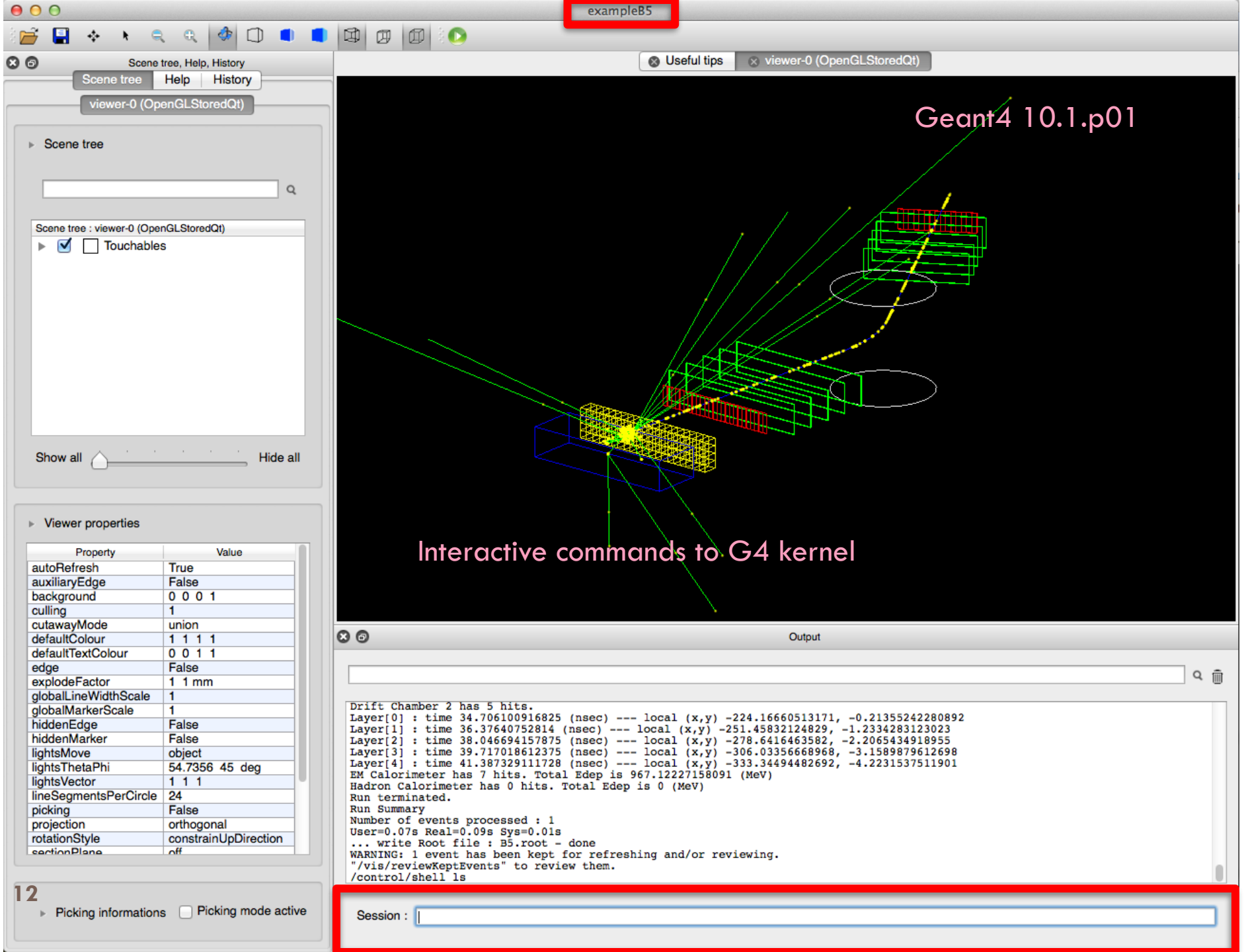
- Most examples come with a visualization macro more complete
  - good starting point

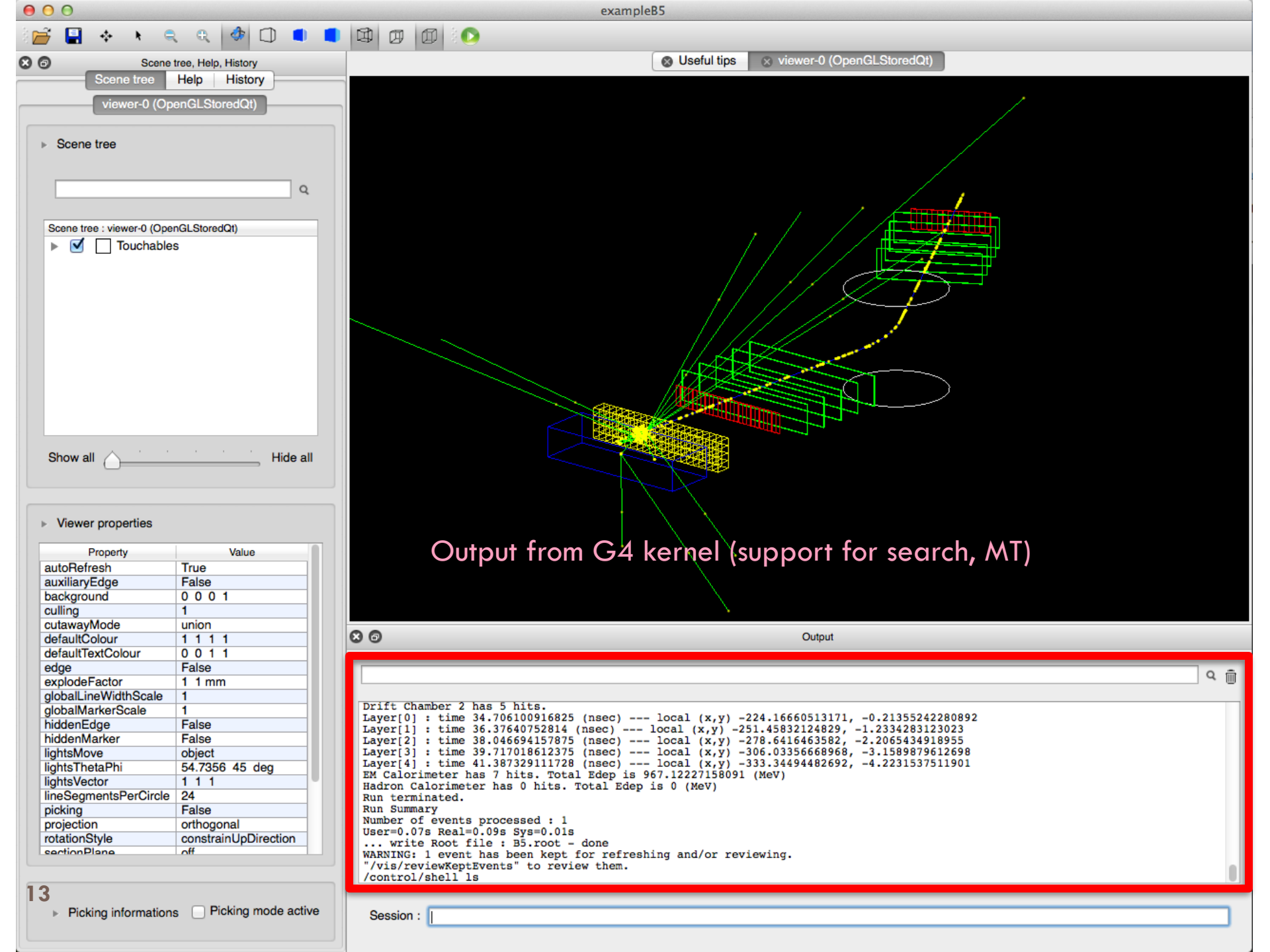
Screenshots on the visualization drivers

- Qt with OpenGL
  - Requires that you install Qt
  - Visualization driver + user interface
  - You can customize the interface to control any Geant4 command
- OpenGL
- OpenInventor
- HepRep
- DAWN
- VRML
- RayTracer
- gMocren
- ASCIITree

1) Qt Driver with OpenGL visualization

- Recent developments focused on Qt User Interface and Visualization
- Geant4 **Qt + OpenGL Documentation**
- Demo…


exampleB5
Scene tree, Help, History
Scene tree
Help
History
viewer-0 (OpenGLStoredQt)
Scene tree
Scene tree : viewer-0 (OpenGLStoredQt)
Touchables
Show all
Hide all
Viewer properties
Property
Value
autoRefresh
True
auxiliaryEdge
False
background
0 0 0 1
culling
1
cutawayMode
union
defaultColour
1 1 1 1
defaultTextColour
0 0 1 1
edge
False
explodeFactor
1 1 mm
globalLineWidthScale
1
globalMarkerScale
1
hiddenEdge
False
hiddenMarker
False
lightsMove
object
lightsThetaPhi
54.7356 45 deg
lightsVector
1 1 1
lineSegmentsPerCircle
24
picking
False
projection
orthogonal
rotationStyle
constrainUpDirection
12
Picking informations
Picking mode active
Useful tips
viewer-0 (OpenGLStoredQt)
Geant4 10.1.p01
Interactive commands to G4 kernel
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
Layer[1] : time 36.37640752814 (nsec) --- local (x,y) -251.45832124829, -1.2334283123023
Layer[2] : time 38.046694157875 (nsec) --- local (x,y) -278.6416463582, -2.2065434918955
Layer[3] : time 39.717018612375 (nsec) --- local (x,y) -306.03356668968, -3.1589879612698
Layer[4] : time 41.387329111728 (nsec) --- local (x,y) -333.34494482692, -4.2231537511901
EM Calorimeter has 7 hits. Total Edep is 967.12227158091 (MeV)
Hadron Calorimeter has 0 hits. Total Edep is 0 (MeV)
Run terminated.
Run Summary
Number of events processed : 1
User=0.07s Real=0.09s Sys=0.01s
... write Root file : B5.root - done
WARNING: 1 event has been kept for refreshing and/or reviewing.
"/vis/reviewKeptEvents" to review them.
/control/shell ls
Session :


exampleB5
Scene tree, Help, History
Scene tree
Help
History
viewer-0 (OpenGLStoredQt)
Scene tree
Scene tree : viewer-0 (OpenGLStoredQt)
Touchables
Show all
Hide all
Viewer properties
Property
Value
autoRefresh
True
auxiliaryEdge
False
background
0 0 0 1
culling
1
cutawayMode
union
defaultColour
1 1 1 1
defaultTextColour
0 0 1 1
edge
False
explodeFactor
1 1 mm
globalLineWidthScale
1
globalMarkerScale
1
hiddenEdge
False
hiddenMarker
False
lightsMove
object
lightsThetaPhi
54.7356 45 deg
lightsVector
1 1 1
lineSegmentsPerCircle
24
picking
False
projection
orthogonal
rotationStyle
constrainUpDirection
13
Picking informations
Picking mode active
Useful tips
viewer-0 (OpenGLStoredQt)
Output from G4 kernel (support for search, MT)
Output
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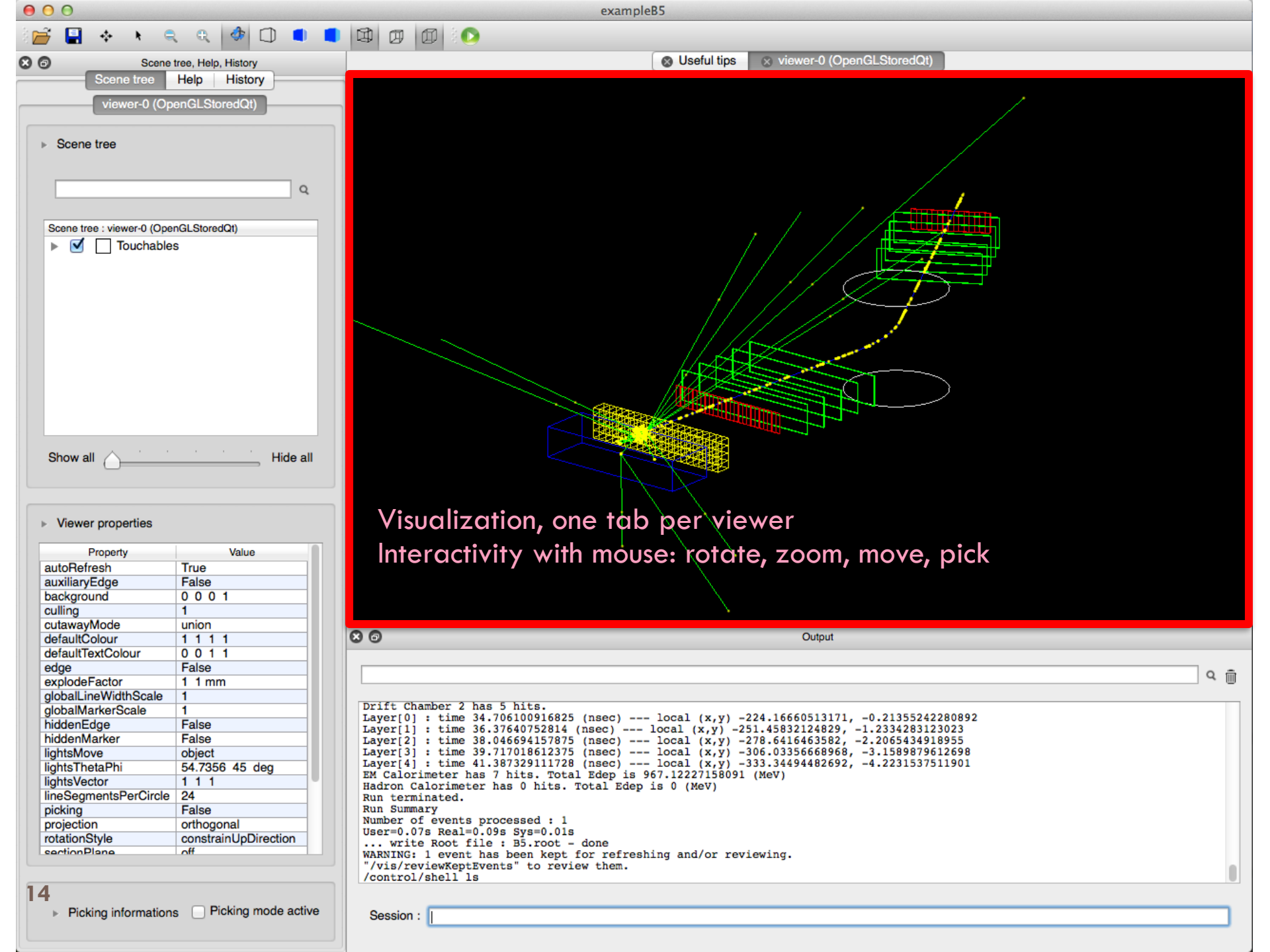
exampleB5
Scene tree, Help, History
Scene tree
Help
History
viewer-0 (OpenGLStoredQt)
Scene tree
Scene tree : viewer-0 (OpenGLStoredQt)
Touchables
Show all
Hide all
Viewer properties
Property
Value
autoRefresh
True
auxiliaryEdge
False
background
0 0 0 1
culling
1
cutawayMode
union
defaultColour
1 1 1 1
defaultTextColour
0 0 1 1
edge
False
explodeFactor
1 1 mm
globalLineWidthScale
1
globalMarkerScale
1
hiddenEdge
False
hiddenMarker
False
lightsMove
object
lightsThetaPhi
54.7356 45 deg
lightsVector
1 1 1
lineSegmentsPerCircle
24
picking
False
projection
orthogonal
rotationStyle
constrainUpDirection
14
Picking informations
Picking mode active
Useful tips
viewer-0 (OpenGLStoredQt)
Visualization, one tab per viewer
Interactivity with mouse: rotate, zoom, move, pick
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
Layer[1] : time 36.37640752814 (nsec) --- local (x,y) -251.45832124829, -1.2334283123023
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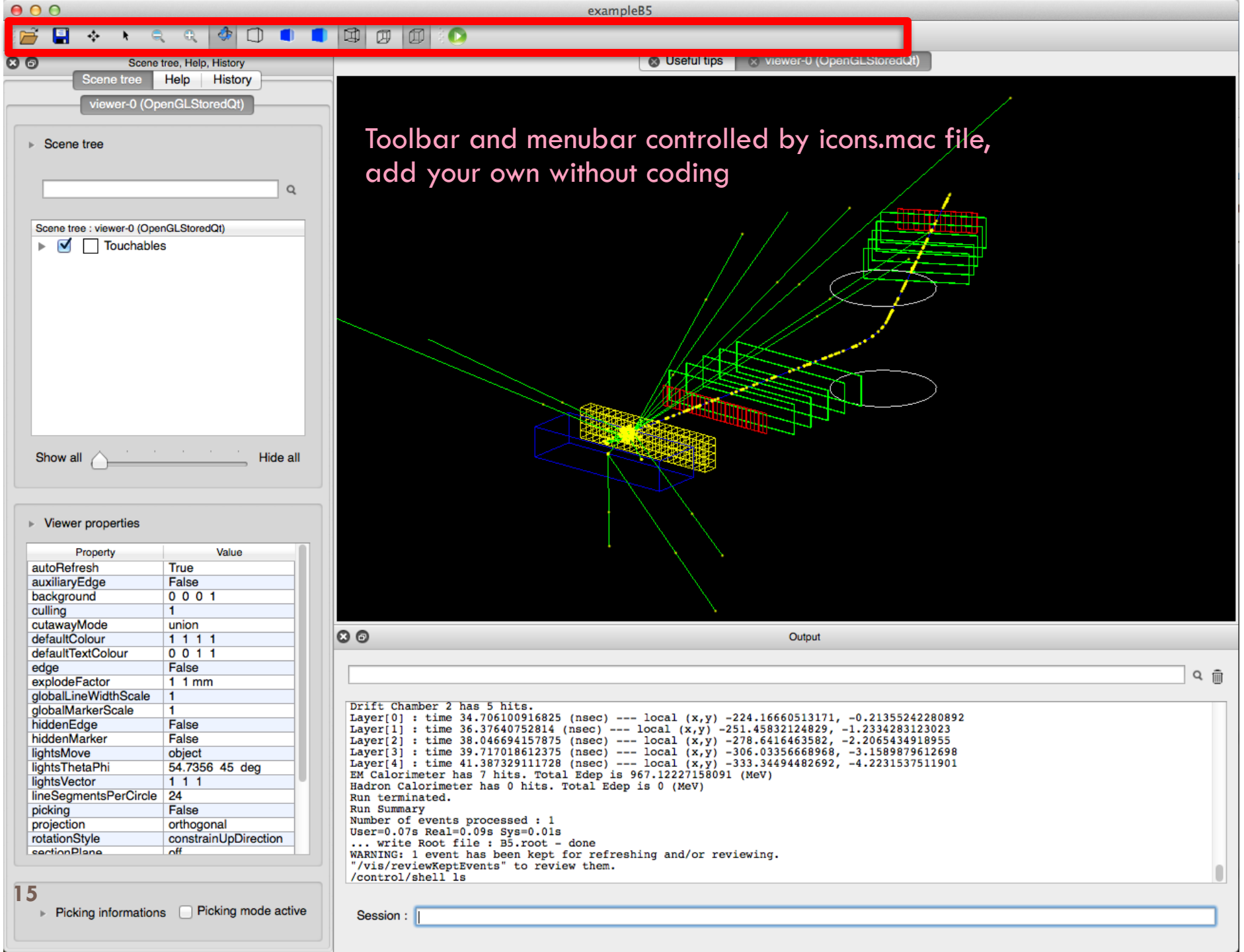
Session :


exampleB5
Scene tree, Help, History
Scene tree
Help
History
viewer-0 (OpenGLStoredQt)
Scene tree
Scene tree : viewer-0 (OpenGLStoredQt)
Touchables
Show all
Hide all
Viewer properties
Property
Value
autoRefresh
True
auxiliaryEdge
False
background
0 0 0 1
culling
1
cutawayMode
union
defaultColour
1 1 1 1
defaultTextColour
0 0 1 1
edge
False
explodeFactor
1 1 mm
globalLineWidthScale
1
globalMarkerScale
1
hiddenEdge
False
hiddenMarker
False
lightsMove
object
lightsThetaPhi
54.7356 45 deg
lightsVector
1 1 1
lineSegmentsPerCircle
24
picking
False
projection
orthogonal
rotationStyle
constrainUpDirection
15
Picking informations
Picking mode active
Useful tips
viewer-0 (OpenGLStoredQt)
Toolbar and menubar controlled by icons.mac file,
add your own without coding
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
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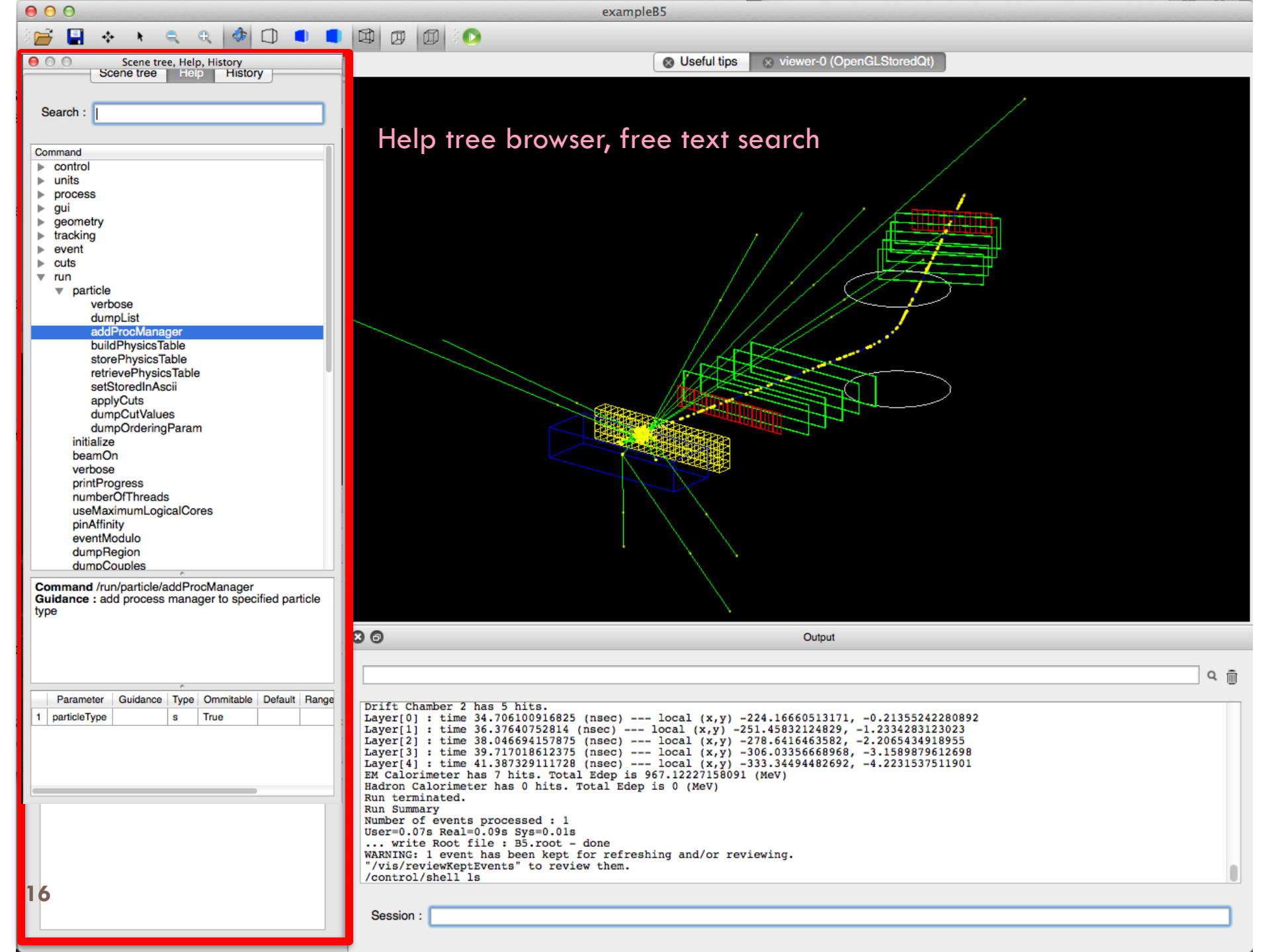
Session :


exampleB5
Scene tree, Help, History
Scene tree
Help
History
Search :
Command
control
units
process
gui
geometry
tracking
event
cuts
run
particle
verbose
dumpList
addProcManager
buildPhysicsTable
storePhysicsTable
retrievePhysicsTable
setStoredInAscii
applyCuts
dumpCutValues
dumpOrderingParam
initialize
beamOn
verbose
printProgress
numberOfThreads
useMaximumLogicalCores
pinAffinity
eventModulo
dumpRegion
dumpCouples
Command /run/particle/addProcManager
Guidance : add process manager to specified particle type
Parameter
Guidance
Type
Ommitable
Default
Range
1
particleType
s
True
Useful tips
viewer-0 (OpenGLStoredQt)
Help tree browser, free text search
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
Layer[1] : time 36.37640752814 (nsec) --- local (x,y) -251.45832124829, -1.2334283123023
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... write Root file : B5.root - done
WARNING: 1 event has been kept for refreshing and/or reviewing.
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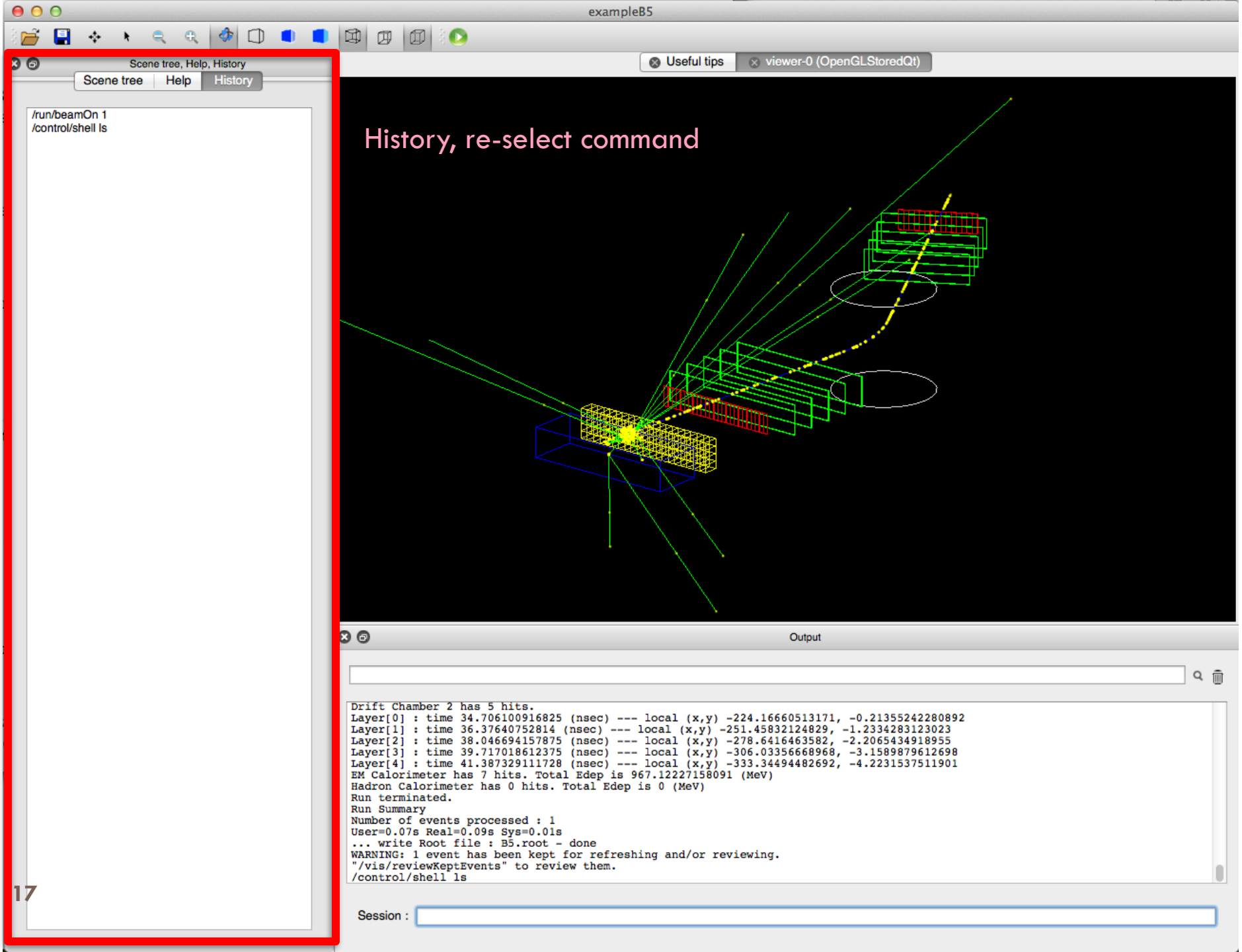
/control/shell ls
Session :


exampleB5
Scene tree, Help, History
Scene tree
Help
History
/run/beamOn 1
/control/shell ls
Useful tips
viewer-0 (OpenGLStoredQt)
History, re-select command
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
Layer[1] : time 36.37640752814 (nsec) --- local (x,y) -251.45832124829, -1.2334283123023
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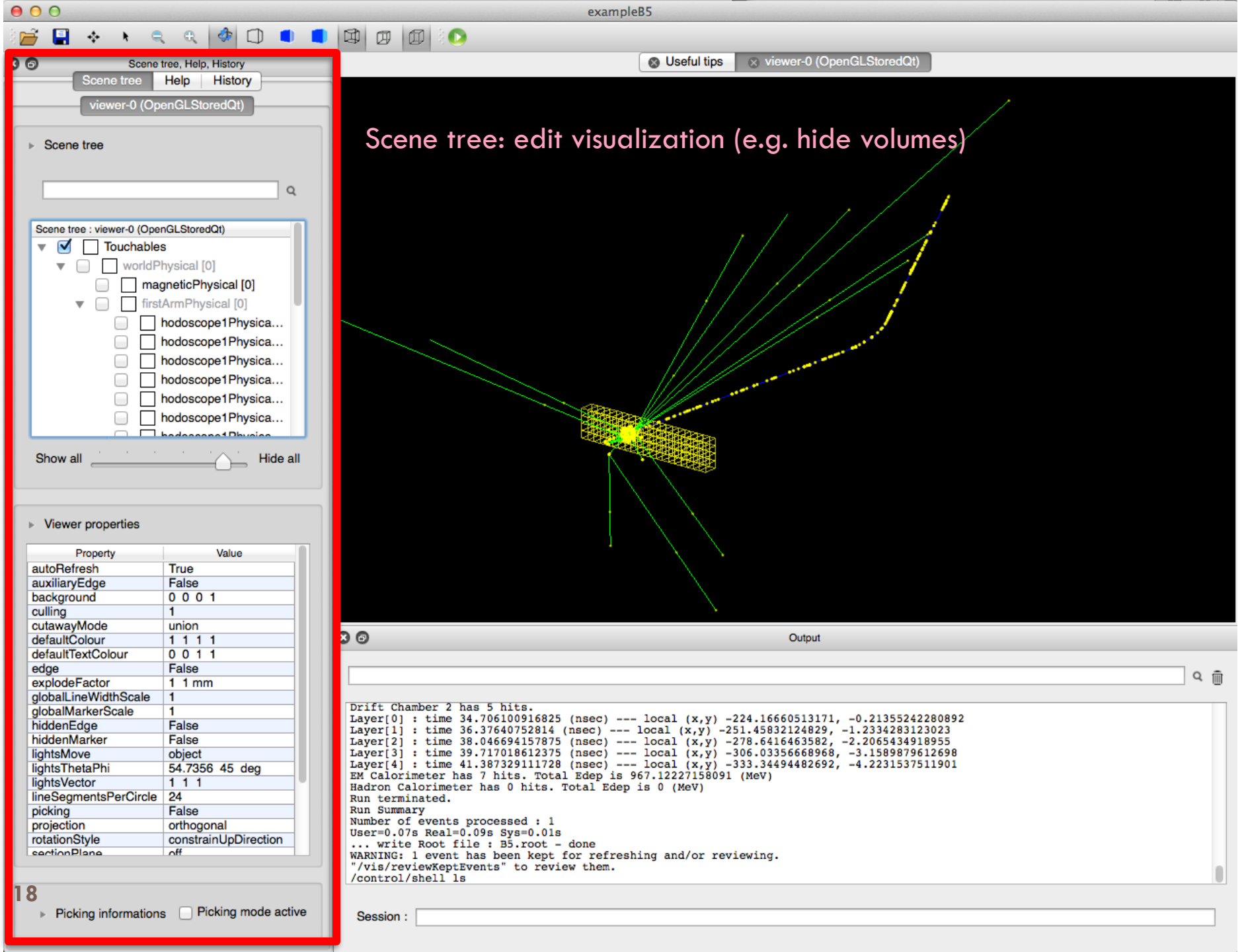
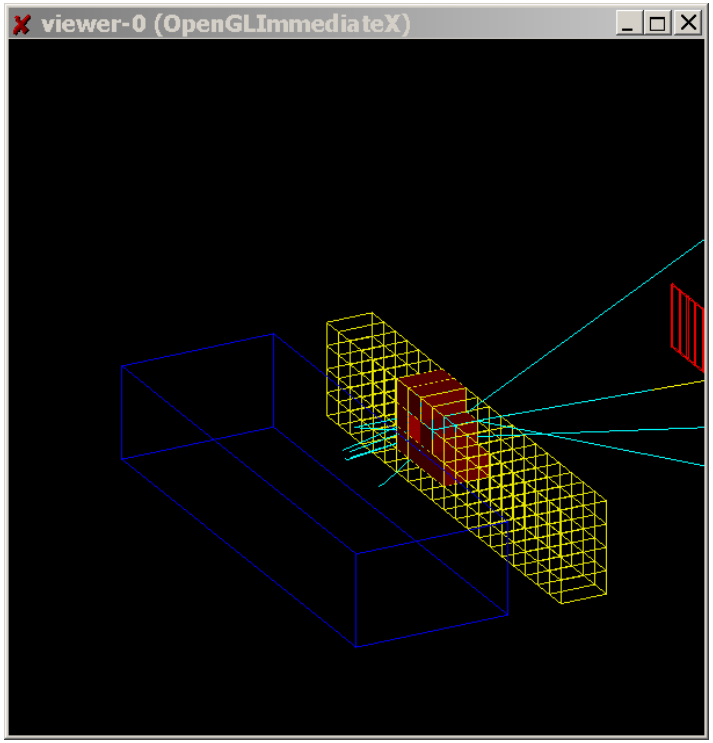
Session :


exampleB5
Scene tree, Help, History
Scene tree
Help
History
viewer-0 (OpenGLStoredQt)
Scene tree
Scene tree : viewer-0 (OpenGLStoredQt)
Touchables
worldPhysical [0]
magneticPhysical [0]
firstArmPhysical [0]
hodoscope1Physica...
Show all
Hide all
Viewer properties
Property
Value
autoRefresh
True
auxiliaryEdge
False
background
0 0 0 1
culling
1
cutawayMode
union
defaultColour
1 1 1 1
defaultTextColour
0 0 1 1
edge
False
explodeFactor
1 1 mm
globalLineWidthScale
1
globalMarkerScale
1
hiddenEdge
False
hiddenMarker
False
lightsMove
object
lightsThetaPhi
54.7356 45 deg
lightsVector
1 1 1
lineSegmentsPerCircle
24
picking
False
projection
orthogonal
rotationStyle
constrainUpDirection
18
Picking informations
Picking mode active
Useful tips
viewer-0 (OpenGLStoredQt)
Scene tree: edit visualization (e.g. hide volumes)
Output
Drift Chamber 2 has 5 hits.
Layer[0] : time 34.706100916825 (nsec) --- local (x,y) -224.16660513171, -0.21355242280892
Layer[1] : time 36.37640752814 (nsec) --- local (x,y) -251.45832124829, -1.2334283123023
Layer[2] : time 38.046694157875 (nsec) --- local (x,y) -278.6416463582, -2.2065434918955
Layer[3] : time 39.717018612375 (nsec) --- local (x,y) -306.03356668968, -3.1589879612698
Layer[4] : time 41.387329111728 (nsec) --- local (x,y) -333.34494482692, -4.2231537511901
EM Calorimeter has 7 hits. Total Edep is 967.12227158091 (MeV)
Hadron Calorimeter has 0 hits. Total Edep is 0 (MeV)
Run terminated.
Run Summary
Number of events processed : 1
User=0.07s Real=0.09s Sys=0.01s
... write Root file : B5.root - done
WARNING: 1 event has been kept for refreshing and/or reviewing.
"/vis/reviewKeptEvents" to review them.
/control/shell ls
Session :

2) OpenGL

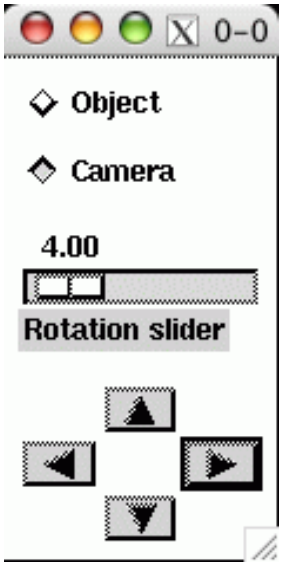
- /vis/open OGL

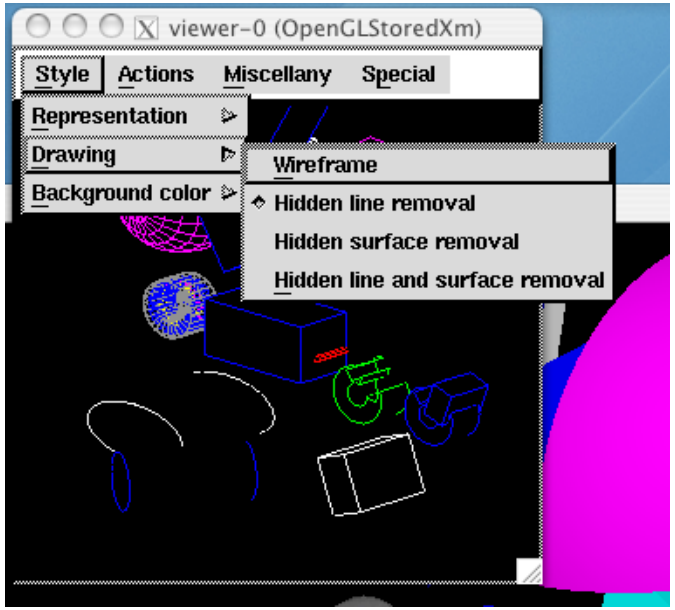
- Features
  - Control directly from Geant4
  - Uses GL libraries that are already included on most Linux and Windows systems
  - Rendered, photorealistic image with some interactive features
    - zoom, rotate, translate
  - Fast response (can usually exploit full potential of graphics hardware)
  - Save as pixel graphics or vector EPS
  - Live movies
  - Geant4 Documentation: **OpenGL**



OpenGL with Motif Control

- Somewhat obsolete now that Qt can take over this functionality
  - but still supported
  - requires that you have Motif and link against this in your Geant4

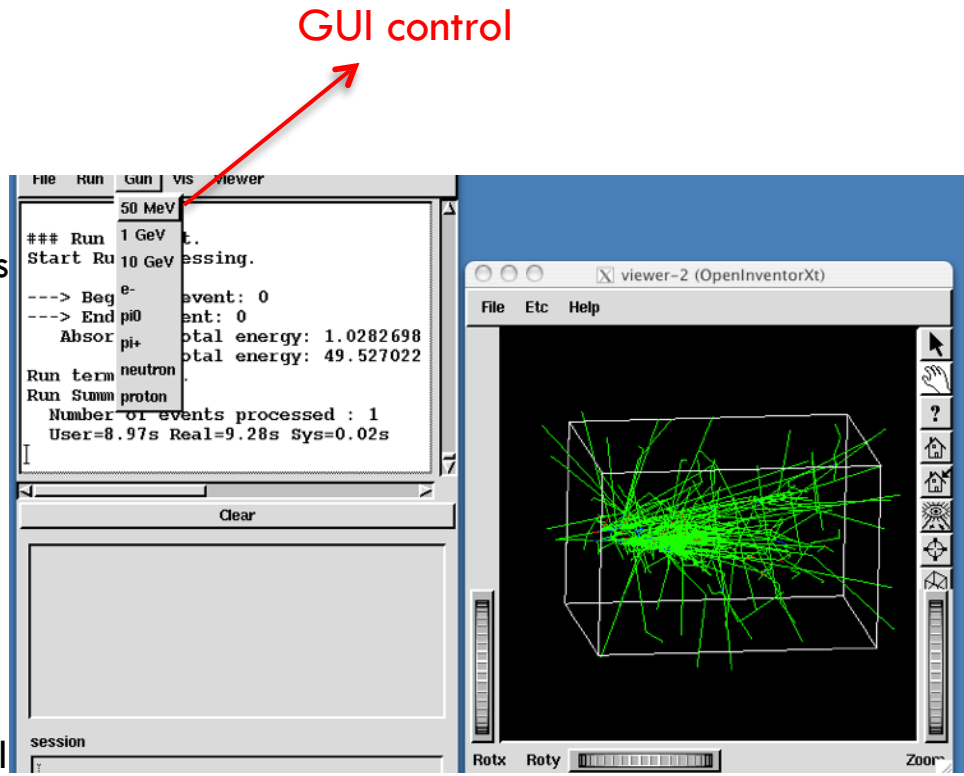




3) OpenInventor

- /vis/open OIX or /vis/open IOWin32

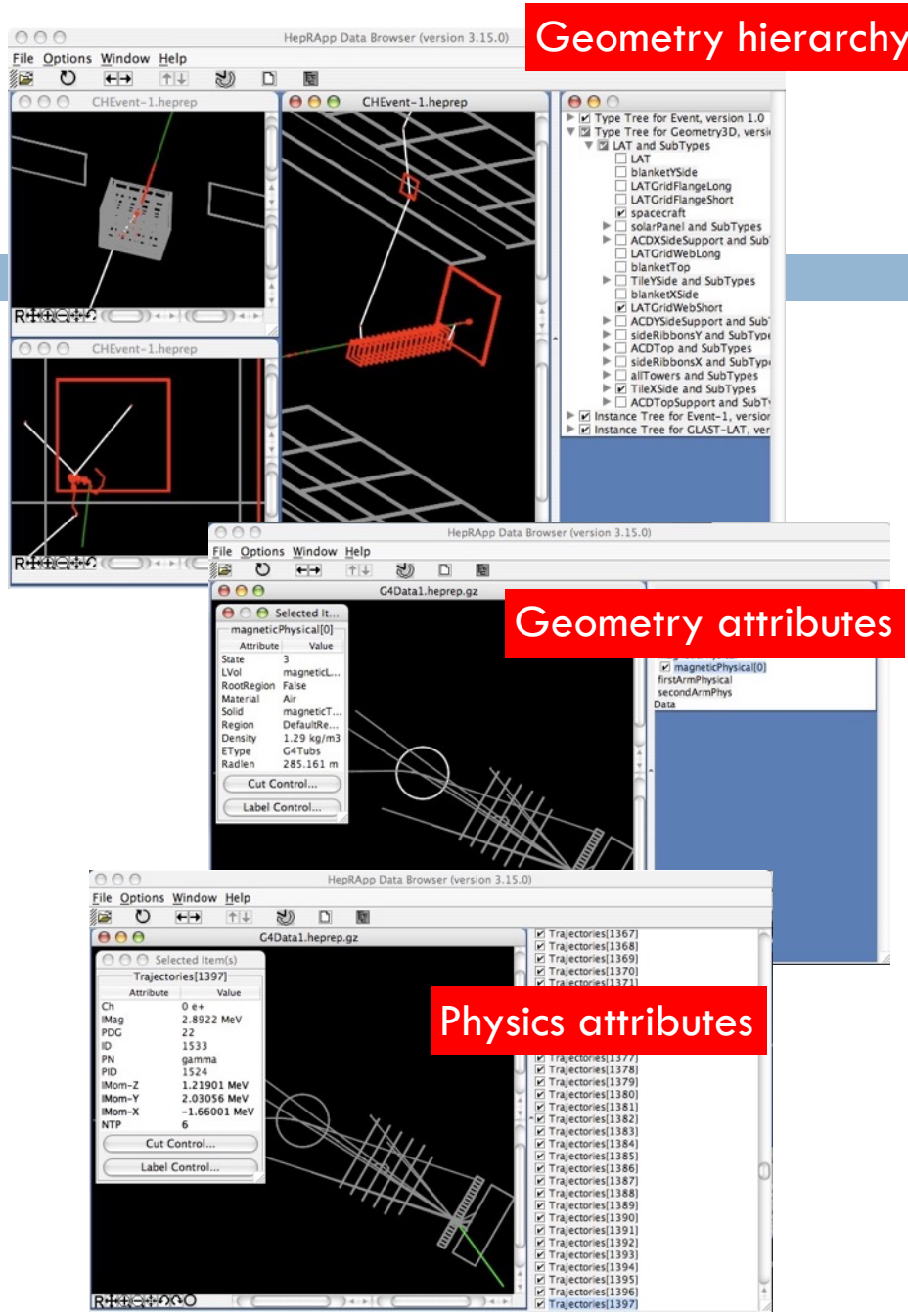
- Features
  - Control from the OpenInventor GUI
  - Requires addition of OpenInventor libraries (freely available for most Linux systems and Windows)
  - Rendered, photorealistic image
  - Many interactive features
    - zoom, rotate, translate
    - click to "see inside" opaque volumes
    - click to show attributes (momentum, etc., dumps to standard output)
  - Fast response (can usually exploit full potential of graphics hardware)
  - Expanded printing ability (vector and pixel graphics)
  - Geant4 Documentation: **OpenInventor**



Warning:
OpenScientist (implementing our OI driver) is discontinued, but you could still try to use it

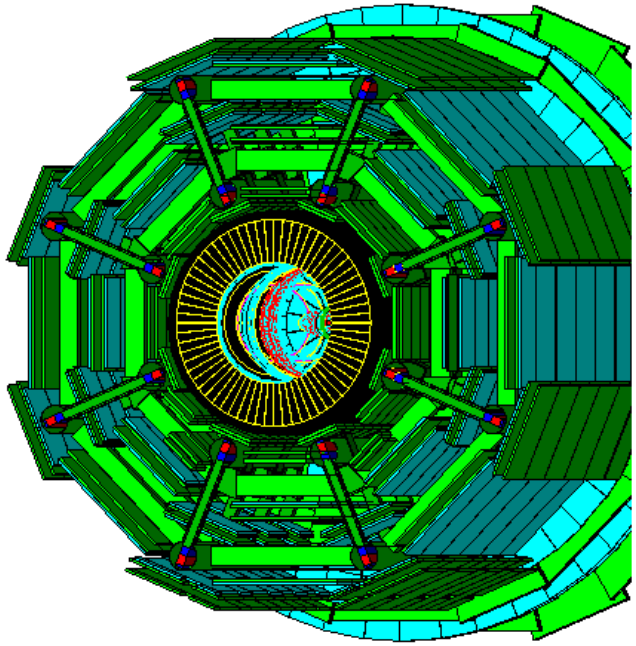
4) HepRep

- /vis/open HepRepFile
- Features
  - The HepRepFile driver creates an XML file in HepRep1 format. This can be viewed with HepRApp HepRep Browser.
  - The HepRepXML driver creates a HepRep file in HepRep2 format that can be viewed with WIRED4 plugin to JAS3 Analysis System or the FRED event display.
  - Requires one of the above browsers (freely available for all systems)
  - Wireframe or simple area fills (not photorealistic)
  - Many interactive features
    - zoom, rotate, translate
    - click to show attributes (momentum, etc.)
    - special projections (FishEye, etc.)
    - control visibility from hierarchical (tree) view of data
  - Hierarchical view of the geometry
  - HepRApp and WIRED4 can export to many vector graphic formats (PostScript, PDF, etc.)
  - Geant4 Documentation: **HepRep**



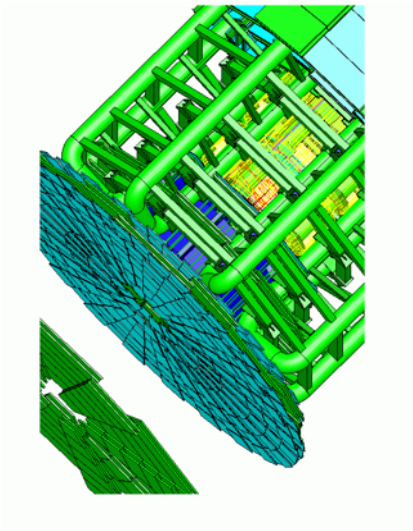
Warning: Issues with recent java versions

5) DAWN



- /vis/open DAWNFILE

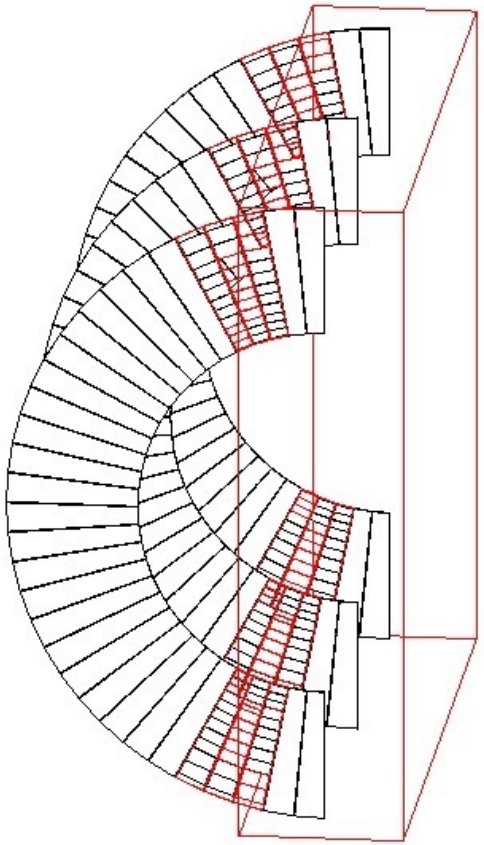
- Features
  - Create a .prim file
  - Requires DAWN, available for all Linux and Windows systems
  - DAWN creates a rendered, photorealistic PostScript image
  - No interactive features once at PostScript stage
  - Highest quality technical rendering - vector PostScript
  - View or print from your favorite PostScript application
  - DAWN file can serve as input of 2 application programs: DAWNCUT and DAVID
  - Geant4 Documentation: **DAWN**



http://geant4.kek.jp/~tanaka/GEANT4/ATLAS_G4_GIFFIG/

DAWNCUT and DAVID

- A standalone program, DAWNCUT, can perform a planar cut on a DAWN image
  - DAWNCUT takes as input a .prim file and some cut parameters. Its output is a new .prim file to which the cut has been applied.
- Another standalone program, DAVID, can show you any volume overlap errors in your geometry
  - DAVID takes as input a .prim file and outputs a new .prim file in which overlapping volumes have been highlighted.

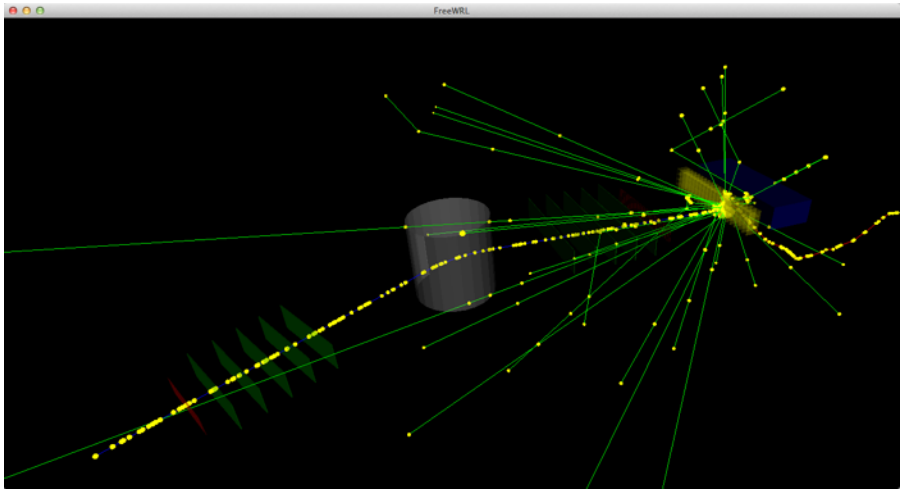


http://geant4.kek.jp/~tanaka/

6) VRML

- /vis/open VRML1FILE or
  /vis/open VRML2FILE

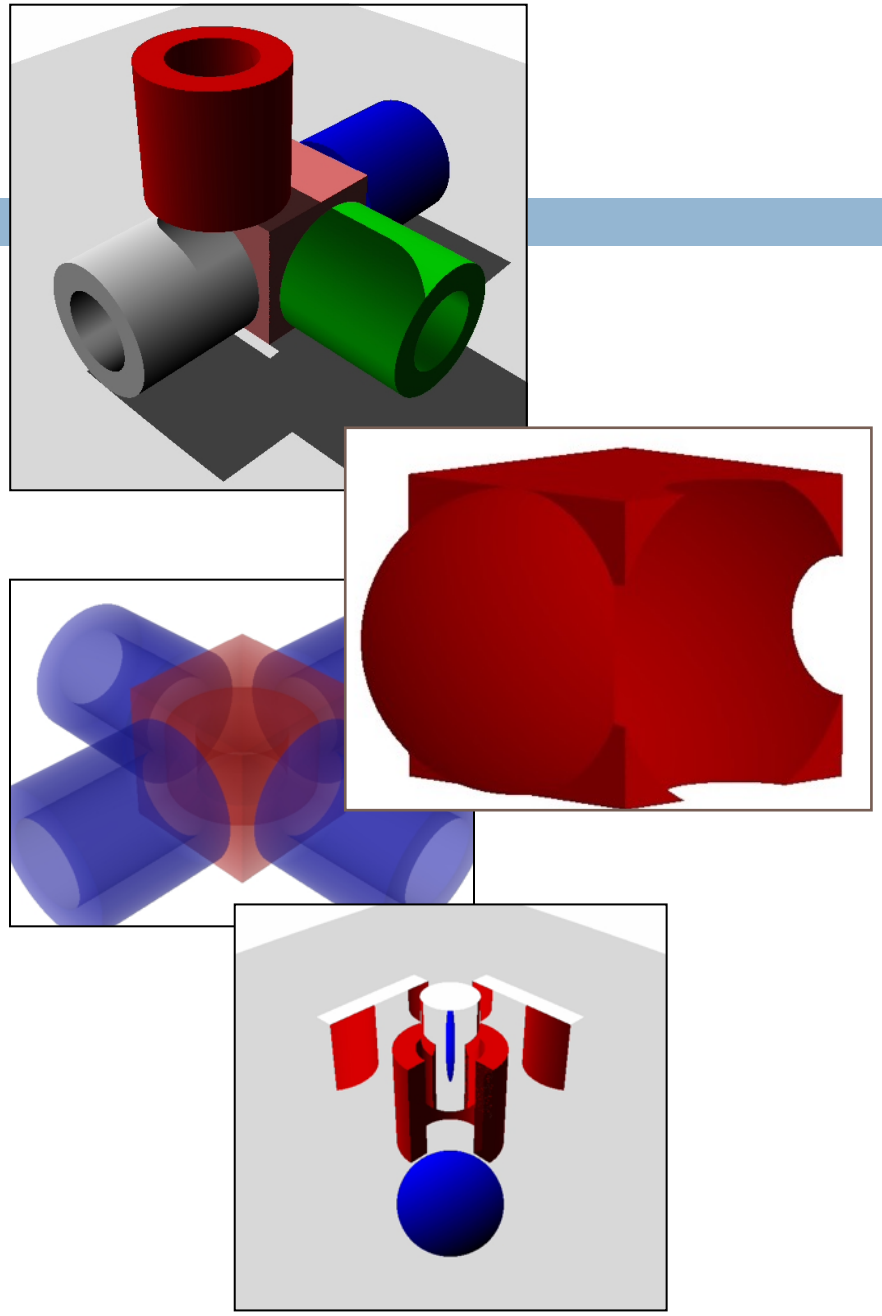
- Features
  - Create a file to view in any VRML browser (some as web browser plug-ins i.e. can be viewed at a remote host)
  - Requires VRML browser (many different choices for different operating systems)
    - FreeWRL
  - Rendered, photorealistic image with some interactive features
    - zoom, rotate, translate
  - Limited printing ability (pixel graphics, not vector graphics)
  - Geant4 Documentation: **VRML**



7) RayTracer

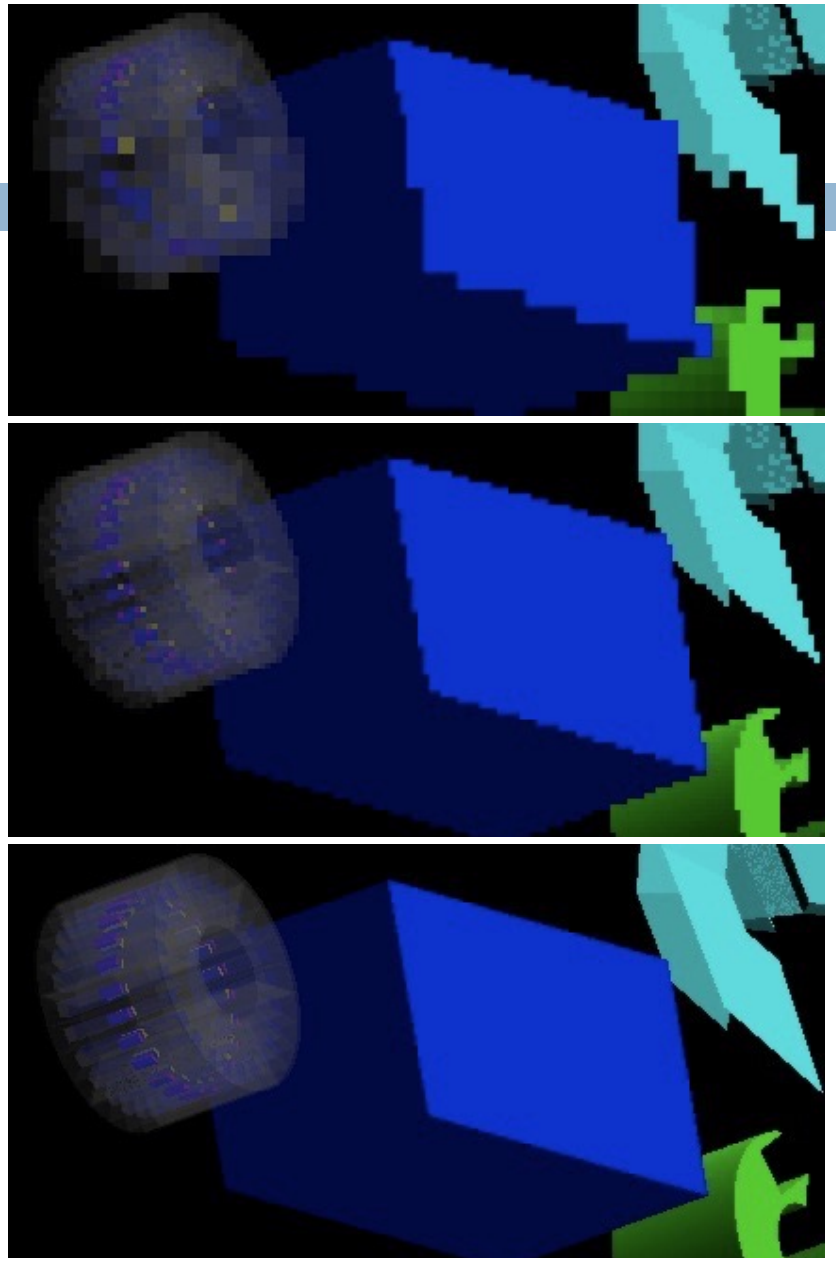
- /vis/open RayTracer

- Features
  - Create a jpeg file (and with RayTracerX option, also draws to x window)
  - Forms image by using Geant4's own tracking to follow photons through the detector
  - Can show geometry but not trajectories
  - Can render any geometry that Geant4 can handle (such as Boolean solids) - no other Vis driver can handle every case
  - Supports shadows, transparency and mirrored surfaces
  - Geant4 Documentation: **RayTracer**



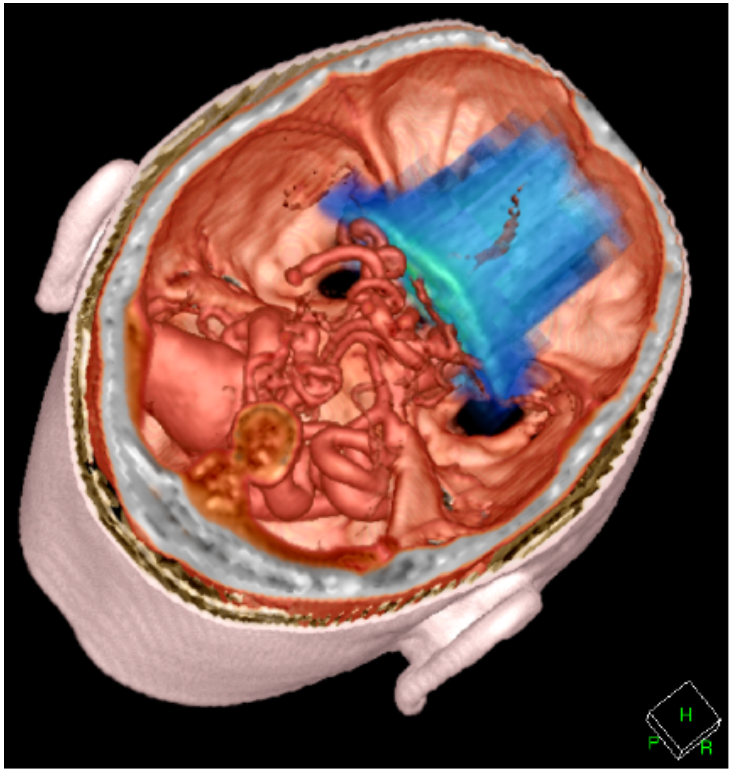
RayTracerX

- You have the option of
  - /vis/open RayTracerX
- Builds same jpeg file as RayTracer, but simultaneously renders to screen so you can watch as rendering grows progressively smoother
- Means you can abort and retry the rendering with different view parameters without having to wait for the complete refinement of the image



8) gMocren

- Great tool available for volume visualization
- From JST/CREST project (Japan) to improve Geant4 for medical physics
- The gMocrenFile driver creates a gdd file then gMocren able to visualize
  - Volume data
    (including overlay of more than one set)
  - Trajectories
  - Geometry
- Runs on
  - Windows, Linux and Mac
  - Based on a commercial package but
    offered freely to all Geant4 users
  - http://geant4.kek.jp/gMocren
  - Installation is straightforward, follow the Download link on the above page
    - First run gMocren's one-click installer
    - Then, inside <gMocren-dir>/gtk, you will find the one-click installer for gtk
- To export Geant4 visualization to gMocren files
  - /vis/open gMocrenFile
  - /vis/scene/add/psHits
  - /vis/viewer/flush
  - many other options available with /score/draw ... commands
- Geant4 Documentation: **gMocren**



9) ASCIITree

- /vis/open ATree
- Features
  - Text dump of the geometry hierarchy
  - Not graphical
  - Control over level of detail to be dumped
  - Can calculate mass and volume of any hierarchy of volumes
- Geant4 Documentation: **ASCIITree**

```
/vis/viewer/flush
        "worldPhysical":0
          "magneticPhysical":0
          "firstArmPhysical":0
            "hodoscope1Physical":0
            "hodoscope1Physical":1 (repeated placement)
            "hodoscope1Physical":2 (repeated placement)
            "hodoscope1Physical":3 (repeated placement)
            "hodoscope1Physical":4 (repeated placement)

Can be set to various levels of detail
        /vis/ASCIITree/verbose <verbosity>
        0: prints physical volume name.
        1: prints logical volume name.
        2: prints solid name and type.
        3: prints volume and density of solid.
        4: calculates and prints mass(es) of volume(s) in scene.

        By default, shows only daughters of first placement and
        not repeat replicas.

        Add 10 to the above to also show repeated placements
        and replicas.
```

ASCIITree: calculate Volume and Mass

- At verbosity level 4, ASCIITree calculates the mass of the complete geometry tree taking into account daughters up to the depth specified for each physical volume.
- The calculation involves subtracting the mass of that part of the mother that is occupied by each daughter and then adding the mass of the daughter, and so on down the hierarchy.

/vis/ASCIITree/Verbose 4

/vis/viewer/flush

"HadCalorimeterPhysical":0 / "HadCalorimeterLogical" / "HadCalorimeterBox"(G4Box), 1.8 m3 , 11.35 g/cm3

- "HadCalColumnPhysical":-1 (10 replicas) / "HadCalColumnLogical" / "HadCalColumnBox"(G4Box), 180000 cm3, 11.35 g/cm3
  - "HadCalCellPhysical":-1 (2 replicas) / "HadCalCellLogical" / "HadCalCellBox"(G4Box), 90000 cm3, 11.35 g/cm3
    - "HadCalLayerPhysical":-1 (20 replicas) / "HadCalLayerLogical" / "HadCalLayerBox"(G4Box), 4500 cm3, 11.35 g/cm3
      - "HadCalScintiPhysical":0 / "HadCalScintiLogical" / "HadCalScintiBox"(G4Box), 900 cm3, 1.032 g/cm3

- Calculating mass(es)...
  - Overall volume of "worldPhysical":0, is 2400 m3
  - Mass of tree to unlimited depth is 22260.5 kg

Movies: time development of the event

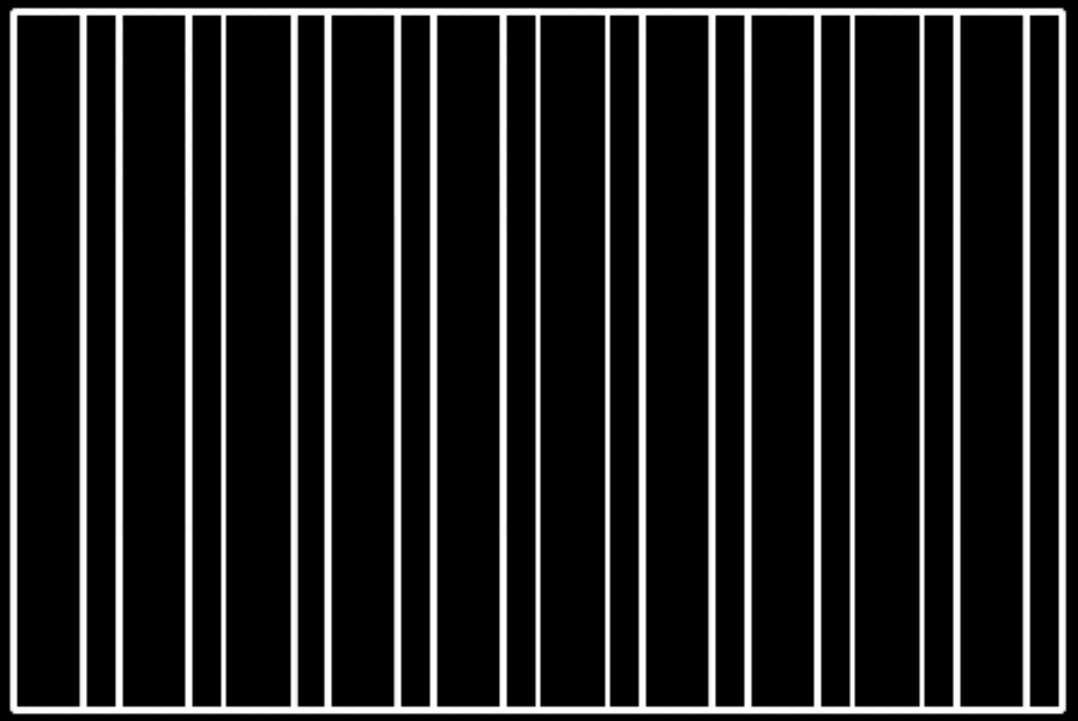
- You can make movies that show time development of an event
  - i.e., a shower in slow motion
- Based on technique of "time-slicing", breaking trajectories into individual slices, each with a time attribute.
  - requires newer visualization features, rich trajectory and some extensions to the OpenGL driver
  - you can run these animations Directly from Geant4, does NOT involve stitching together a movie by hand
- A collection of example movies has been prepared by John Allison: http://www.hep.man.ac.uk/u/johna/pub/Geant4/Movies/
- How-To Presentation: http://geant4.slac.stanford.edu/Presentations/vis/HowToMakeAMovie.ppt http://geant4.slac.stanford.edu/Presentations/vis/HowToMakeAMovie.pdf
- Geant4 Documentation: **movies**

http://www.hep.man.ac.uk/u/johna/pub/Geant4/Movies/pi-10Gevpi+neutronSideView.mp4

10 GeV pion

3 ns

Mpeg4 encoding with
QuickTime Pro



Tutorials and references on the Web !

- DAWN
  - http://geant4.slac.stanford.edu/Presentations/vis/G4DAWNTutorial/G4DAWNTutorial.html
  - http://geant4.kek.jp/~tanaka/DAWN/About_DAWN.html
  - DAWNCUT
    - http://geant4.kek.jpJ/~tanaka/DAWN/About_DAWNCUT.html
  - DAVID
    - http://geant4.kek.jp/~tanaka/DAWN/About_DAVID.html
  - And more…
    - http://geant4.kek.jp/~tanaka/
- gMocren
  - http://geant4.kek.jp/gMocren
- HepRApp
  - http://www.slac.stanford.edu/~perl/HepRApp
  - http://geant4.slac.stanford.edu/Presentations/vis/G4HepRAppTutorial/G4HepRAppTutorial.html
- OpenGL
  - http://geant4.slac.stanford.edu/Presentations/vis/G4OpenGLTutorial/G4OpenGLTutorial.html
- OpenScientist
  - http://openscientist.lal.in2p3.fr
- Qt
  - http://geant4.in2p3.fr/spip.php?rubrique25&lang=en

File Options
Orientation Actions
To select from among
right mouse button
Orientation A
Orientation T
Projection
Mouse Functi
Drawing Opti
Geant4 Vis Tutorial using th
File Edit View Go Bookmarks Tool
And here is a good time to discuss
graphics (not bitmapped graphics). A
viewer's zoom feature, the image will
Now that you have some basic fam
created during the previous tutorial w
file called:
geant4\examples\extended\analysis\A
Or, if you skipped running Geant4 for
Run DAWN on this file:
dawn g4_01.prim
Go to the DAWN GUI's page 1 and
On the same page, change "Camera
you can type in a specific number to c
new value).
You should end up with an image a
Document: Done (0.741 s
Geant4 Vis Tutorial
File Edit View Go Bookma
The output appears as
included automatically
One last command for
the detector was drawn
command:
/vis/viewer/se
/run/beamOn 1
The detector will then
to still seee the tracks
viewer-0 (Ope
Document: Dor
Geant4 @ IN2P3 - Geant4 Qt User Interface tutorial (based on 4.9.6 version)
http://geant4.in2p3.fr/spip.php?article84&lang=en
Bethesda AnatomyAtlas SearchHypernews TopasBeta BetaExtra BetaGroup TOPAS Alpha AlphaGroup topas CMakeSyntax
Geant4@IN2P3
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The BioRad project
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Geant4 Qt User Interface tutorial (based on 4.9.6 version)
Geant4 Qt User Interface tutorial (based on 4.9.6 version)
First tutorial : Download/Compilation/Installation/Launch B1
Step 1: Download Geant4
Step 2: Compilation and Installation (at 25")
Step 3: Example (B1) compilation (at 2'06)
Step 4: Run example (at 2'32)
exampleB1
Geant4
exampleB1
Second tutorial : User Interface demo
Step 5: Qt interface
Step 6: Making movies (at 6'12)
Step 7: Export hight quality pictures (at 8'00)

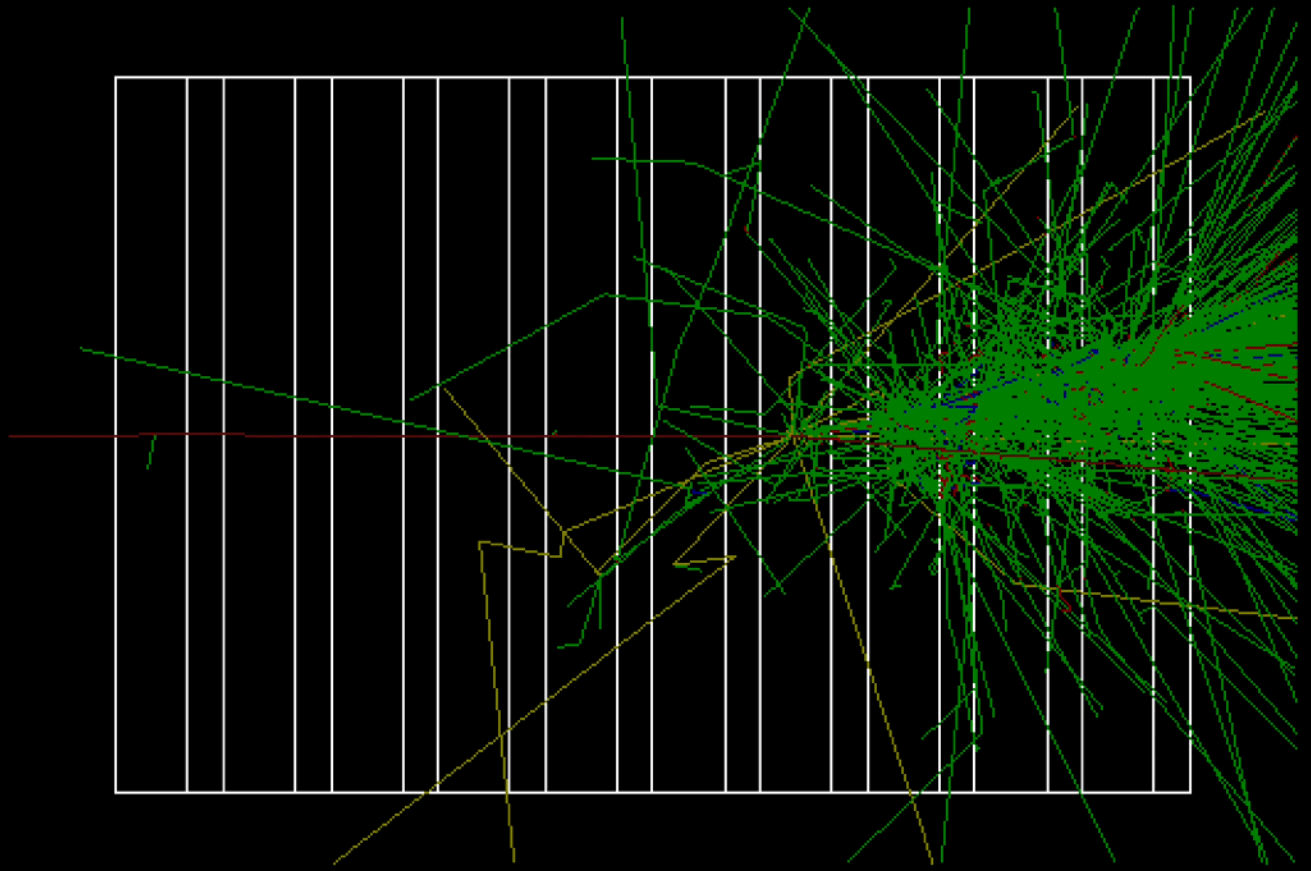
Summary

- Many visualization drivers are available
- The most recent : Qt + OpenGL
  - Visualization
  - GUI interface
- Movies
- Tutorials are available on the Internet

Backup

Additional notes on OpenGL

- There are actually two OpenGL modes, OGLS and OGLI
  - Stored mode: creates graphical database (display lists). Redrawing is faster because Geant4 only needs to resend parts that have changed. Nothing is lost on simple operations like change of viewing angle.
  - Immediate mode: draws only to screen, no "memory"; detector can be redrawn after view changes but event data is lost.
- And if you have Qt and Motif built and configured, even more options:
  - OGLSX, OGLIX, OGLSWin32 and OGLIWin32 are basic OpenGL (stored, immediate, stored for Microsoft Windows, immediate for Microsoft Windows)
  - OGLSQt and OGLIQt are OpenGL with Qt
  - OGLSXm and OGLIXm are OpenGL with Motif
- When you just use /vis/open OGL,
  - We provide you the most advanced OpenGL that you currently have configured - Qt if you have it, otherwise Motif, otherwise basic OpenGL
  - We give you Stored mode unless starts to use too much memory, in which case we switch to Immediate mode
  - We worry for you about whether you're on Windows or not
- To explicitly specify stored or immediate, but leave other decisions to us:
  - /vis/open OGLS
  - /vis/open OGLI

John Allison: http://www.hep.man.ac.uk/u/johna/ Movie with narration

10 GeV proton