

# Geant 4

## Parallel Session 4B Visualization Status and Plans

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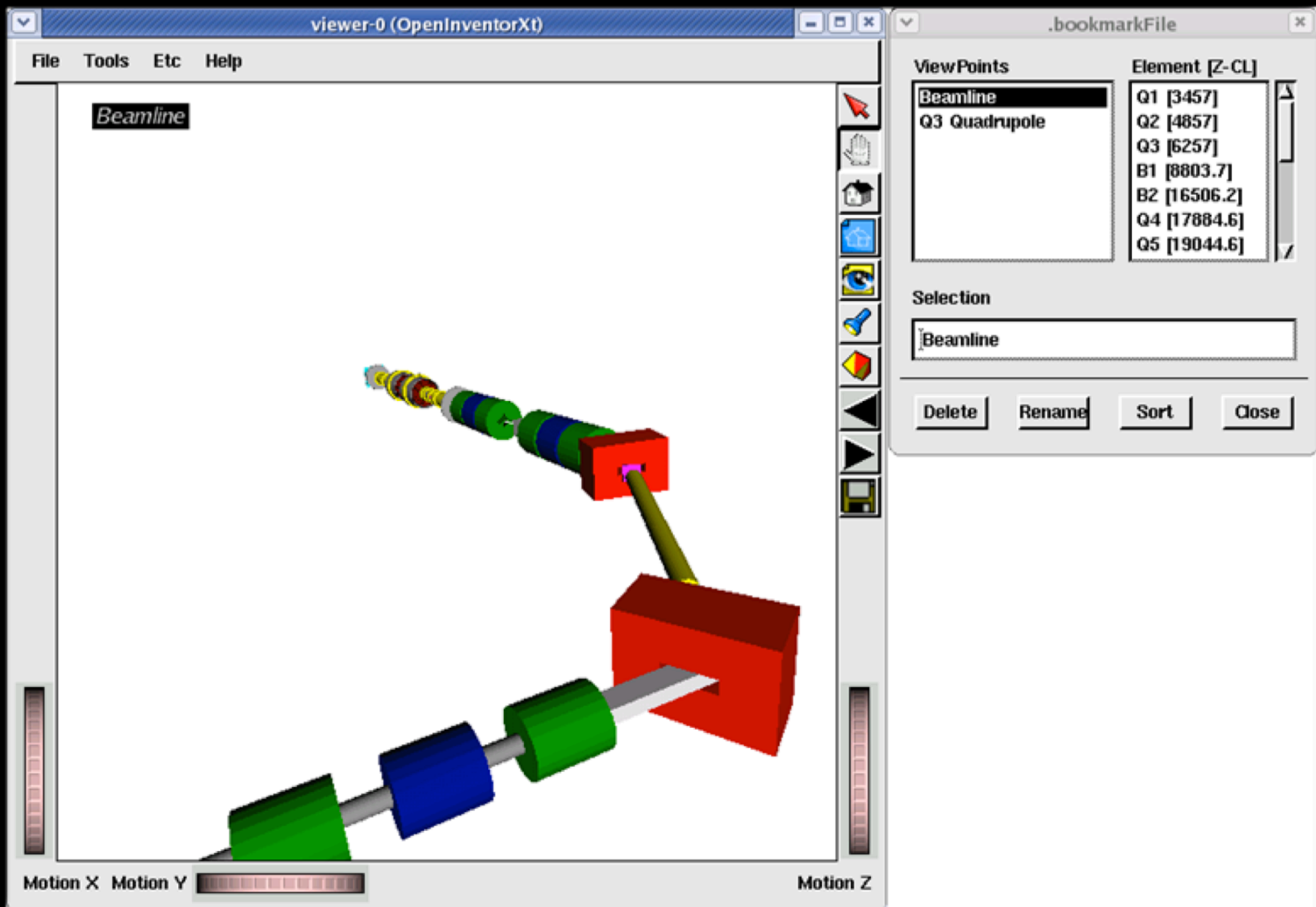
Geant4 Collaboration Meeting  
Chartres, 11 September 2012

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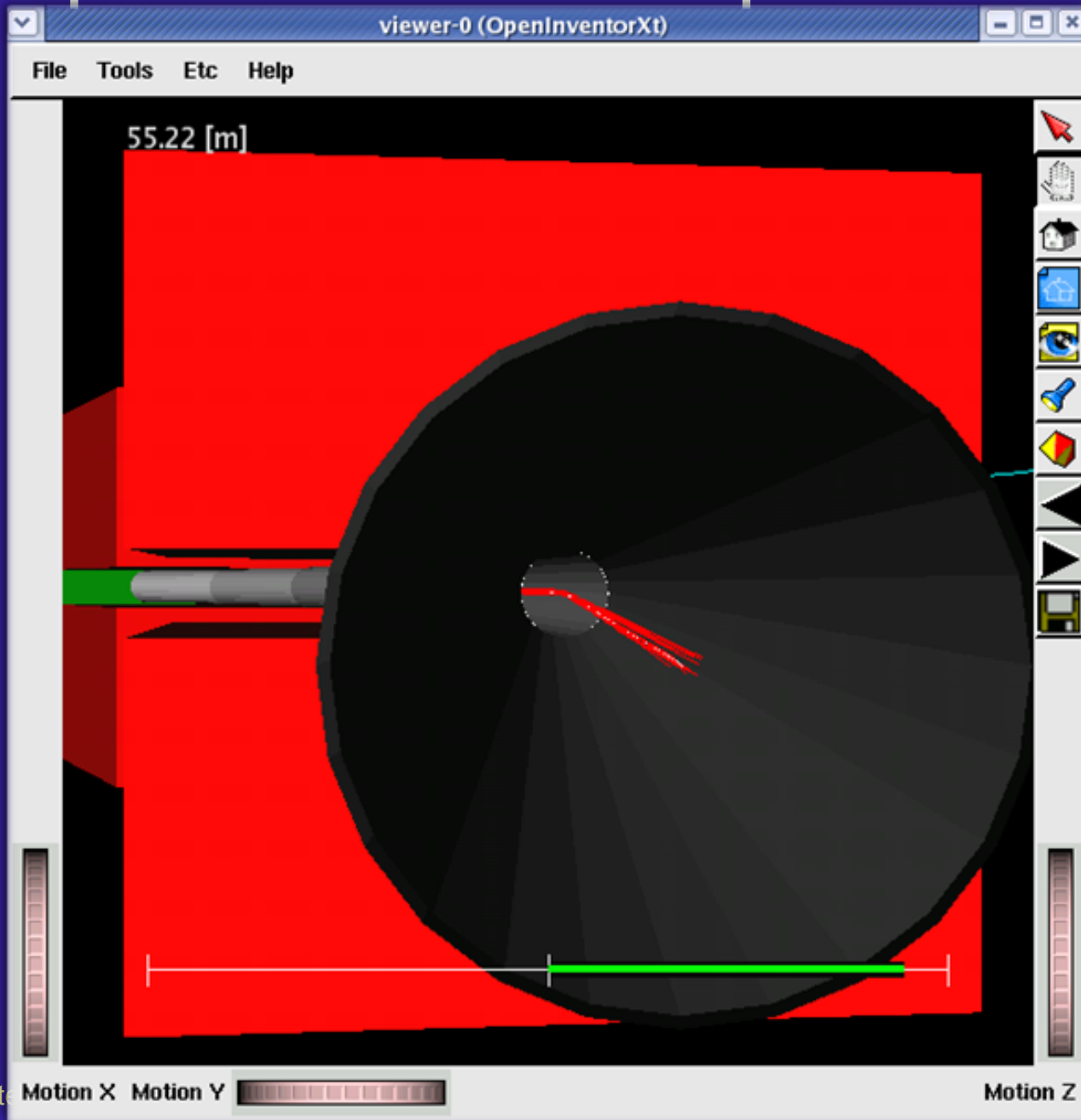
# Improvements to OpenInventor

- Fred Jones showed improvements to new version of the OpenInventor driver aimed at beamline applications (by himself and Pierre-Luc Gagnon).
- Adds critical functionality for users modeling beamlines.
- Lets user specify specific viewpoints along the beamline
- Set rotation axes relative to beamline components
- Fly along the path of a trajectory
- Will be included at release 9.6 as option in existing OpenInventor driver and associated OpenInventor viewer
- OpenInventor is a very powerful visualization system.  
Try it!!!

# Improvements to OpenInventor



# Improvements to OpenInventor



11 Sept

Motion X Motion Y

Motion Z

4

# Updates to Qt Visualization

- Laurent Garnier reviewed updates to Qt.
- Redefine user interface to have lots of useful things in one click
- Allow to see outputs all the time instead of switching between history, cout and help component
- Add a scene tree browser to show, hide or change color and transparency on volumes

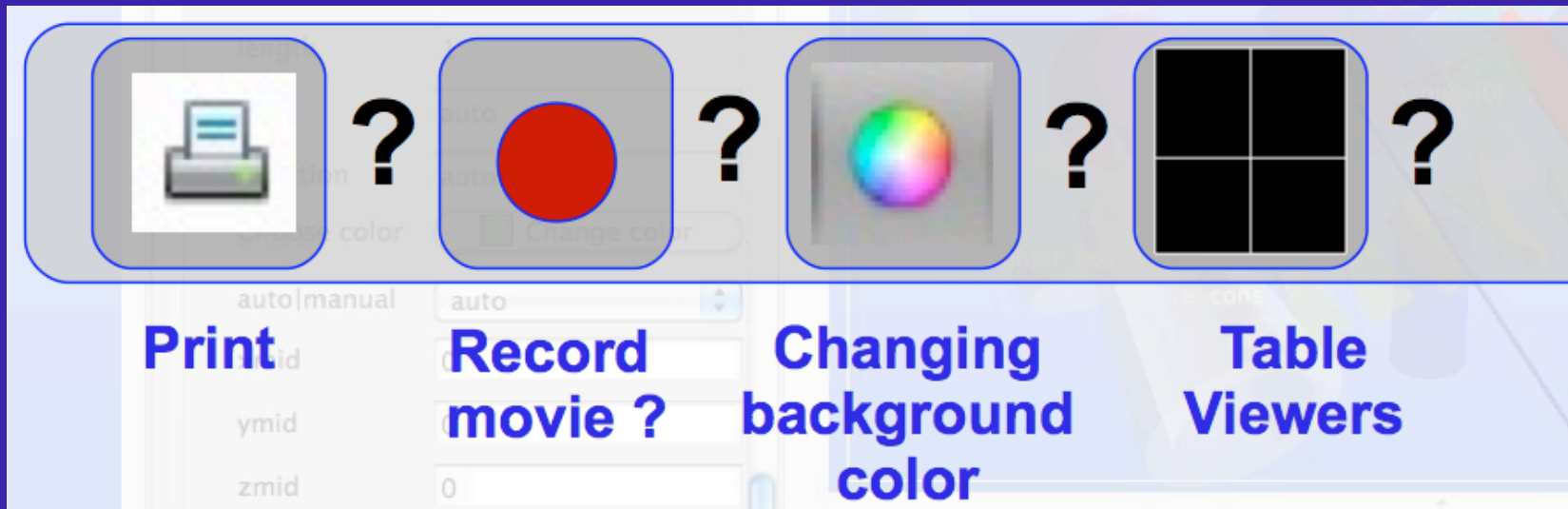
# Updates to Qt Visualization

The screenshot displays the Geant4 Qt visualization interface. The main window is titled "G4UI Session" and contains a 3D scene. The scene includes a white cone labeled "Shape1" and a grey cube labeled "Shape2". A green "G4" logo is visible in the bottom right of the scene. The date and time "Mon Sep 10 15:35:00 2012" are displayed in the top right corner of the scene. The left sidebar shows a list of objects with checkboxes: Axes, Date, Frame, Logo, Logo2D, Scale, Text, Text2D, and Touchables. Below the list is a "Touchables slider" and a "Search" field. The bottom right corner shows the "Output" window with the following text:

```
/vis/viewer/set/style surface
/vis/viewer/set/hiddenMarker true
/vis/viewer/set/viewpointThetaPhi 120 150
#
# Re-establish auto refreshing and verbosity:
/vis/viewer/set/autoRefresh true
/vis/viewer/refresh
```

# Updates to Qt Visualization

- Easy to extend.
- Open to new ideas for built-in buttons.



- Qt is easy to install. Try it out and give feedback to Laurent.

# Challenges of Multiple Platforms

- Joseph Perl gave a rant on the following topic:
- It is difficult to guarantee interactive Vis behavior when we have so many different supported platforms.
- Users want to have whatever Linux they prefer, yet expect Geant4 developers to maintain usability on these platforms.
- Users are saving themselves money by using Ubuntu or other free platforms, then expecting others to provide thousands of dollars in free consulting to make code work on those free platforms.
- The weight of this issue falls very heavily on the Vis group and on Ben Morgan, yet we are not offered any additional resources to deal with these issues.
- No conclusions, just worries.



# Visualization for Geant4.10

- John Allison led a discussion on what might be for release 4.10.
- Main discussion was about how we will handle MT.
- In most cases, visualization is used without MT.
- But a key use case is for users who have very complex events (such as LHC) that take a long time to process. In this case one might want to visualize all events from many threads, since it takes many threads to get a decent event rate in the visualization.
- We already have most of what we need.
  - The vis system has for a long time had the concept of “event keeping”. That is, when one activates vis, one tells the run manager not to delete the event when a new event comes, but to instead keep a queue of more than one event. Vis can then go back and forth among events to visualize whichever the user wants.
  - Extension for MT then is just to let many threads contribute to this event queue. Visualization itself remains single threaded.