

# Visualization Developments and Plans

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for the Geant4 Visualization WG



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# Highlights of the current Beta - 1

- Added new `/vis/open` command for OpenGL viewers/`/vis/open OGL`
  - This new form allows the same macro to be used whether one is on Linux or Windows (calling `OGLSX` on Linux and `OGLSWin32` on Windows).
  - When the example has been built with Qt, it will use the Qt form of OpenGL.
  - When the example has been built with Motif, it will use the Motif form of OpenGL.
  - Also added options `OGLI` and `OGLS` to force Immediate or Stored use while still being somewhat generic.
  - The user is still free to use the older, specific viewer names, such as `OGLIX`, but the simple form, `OGL`, will give the most portable macros.
- Added new `/vis/open` command for OpenInventor, `/vis/open OI`
- Speed improvements for OpenGL
  - removing redundant transmissions of points and unnecessary redraws



# Highlights of the current Beta - 2

- ✦ Modified trajectory modeling command
  - ✦ `/vis/modeling/trajectories/create/drawByParticleID`
    - ✦ Used to default all trajectories to grey, with the user having to explicitly set any other color code.
    - ✦ While the user can still set any color code they wish, the default has been improved to:
      - ✦ `e-` - red
      - ✦ `e+` - blue
      - ✦ `proton` - cyan
      - ✦ `gamma` - green
      - ✦ `neutron` - yellow
      - ✦ `pi+`, `pi-`, `pi0` - magenta
      - ✦ `other` - grey
- ✦ Added new commands
  - ✦ `/vis/scene/add/digis` and `/vis/filtering/digi`
  - ✦ analogous to the already-existing commands
    - ✦ `/vis/scene/add/hits` and `/vis/filtering/hits`
  - ✦ Just as the user of hits visualization has to provide a hits class, the user of the digitization visualization has to provide a digi class



# Revised Vis Usage in Most Examples

- ✦ Removed code from EventAction that can now be done by commands
  - ✦ such as adding trajectories
  - ✦ or setting color code
- ✦ Improved Vis macros
- ✦ We did not change the resulting behavior
  - ✦ except for adding step points to the trajectories in appropriate cases
- ✦ The new vis macros demonstrate the best and most flexible current usage



# Typical new Vis.Mac (1)

- # Use this open statement to create an OpenGL view:  
/vis/open OGL 600x600-0+0
- #
- # Use this open statement to create a .prim file suitable for viewing in DAWN:  
#/vis/open DAWNFILE
- #
- # Use this open statement to create a .heprep file suitable for viewing in HepRApp:  
#/vis/open HepRepFile
- #
- # Use this open statement to create a .wrl file suitable for viewing in VRML viewer:  
#/vis/open VRML2FILE
- #
- # Disable auto refresh and quieten vis messages whilst scene and  
# trajectories are established:  
/vis/viewer/set/autoRefresh false  
/vis/verbose errors
- #
- # Draw geometry:  
/vis/drawVolume
- #
- # Specify view angle:  
#/vis/viewer/set/viewpointThetaPhi 90. 0.



# Typical new Vis.Mac (2)

- # Specify zoom value:
- #/vis/viewer/zoom 2.
- #
- # Specify style (surface or wireframe):
- #/vis/viewer/set/style wireframe
- #
- # Draw coordinate axes:
- #/vis/scene/add/axes 0 0 0 1 m
- #
- # Draw smooth trajectories at end of event, showing trajectory points
- # as markers 2 pixels wide:
- /vis/scene/add/trajectories smooth
- /vis/modeling/trajectories/create/drawByCharge
- /vis/modeling/trajectories/drawByCharge-0/default/setDrawStepPts true
- /vis/modeling/trajectories/drawByCharge-0/default/setStepPtsSize 2
- # (if too many tracks cause core dump => /tracking/storeTrajectory 0)
- #
- # Draw hits at end of event:
- #/vis/scene/add/hits



# Typical new Vis.Mac (3)

- # To draw only gammas:
- #/vis/filtering/trajectories/create/particleFilter
- #/vis/filtering/trajectories/particleFilter-0/add gamma
- #
- # To invert the above, drawing all particles except gammas,
- # keep the above two lines but also add:
- #/vis/filtering/trajectories/particleFilter-0/invert true
- #
- # Many other options are available with /vis/modeling and /vis/filtering.
- # For example, to select colour by particle ID:
- #/vis/modeling/trajectories/create/drawByParticleID
- #/vis/modeling/trajectories/drawByParticleID-0/set e- blue
- #
- # To superimpose all of the events from a given run:
- #/vis/scene/endOfEventAction accumulate
- #
- # Re-establish auto refreshing and verbosity:
- /vis/viewer/set/autoRefresh true
- /vis/verbose warnings
- #
- # For file-based drivers, use this to create an empty detector view:
- #/vis/viewer/flush



# News from Satoshi, Akinori and Kyoko

- ✦ DAWN has been updated.
  - ✦ Linux and Mac updates done.
  - ✦ Windows update on the way.
- ✦ gMocren now runs on all platforms
  - ✦ Windows
  - ✦ Linux
  - ✦ Mac
- ✦ Some gMocren images and a preview of something new
  - ✦ volume/surface fusion