

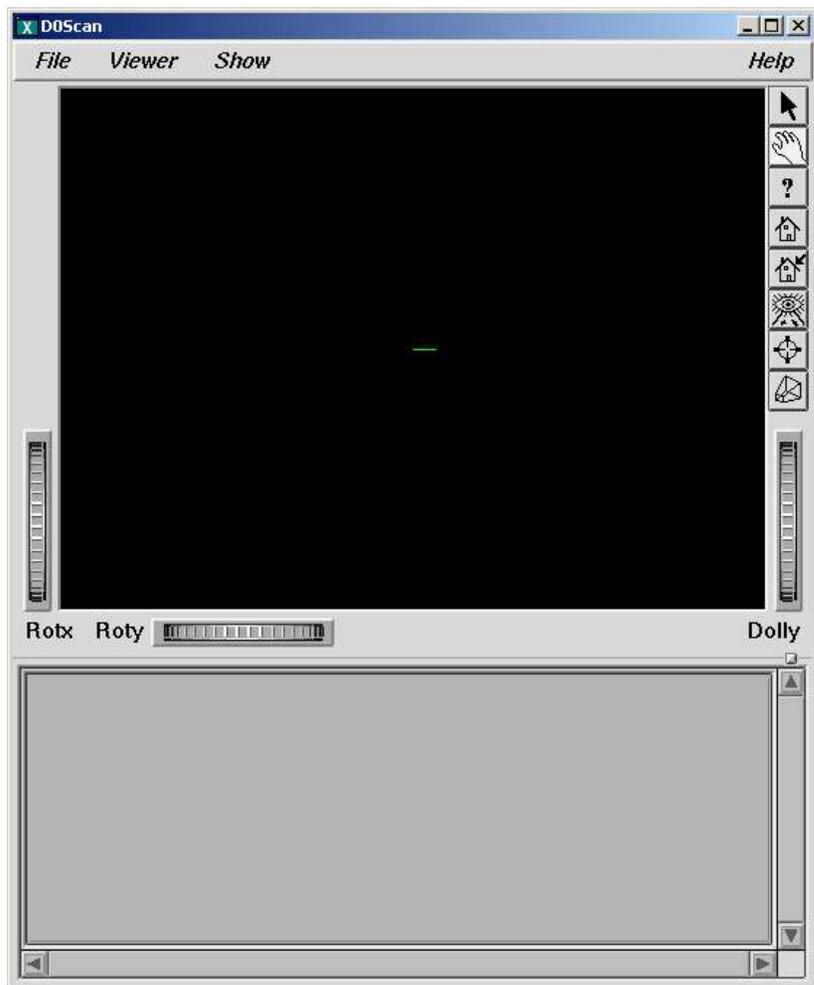
# DØScan Through Pictures

You should probably start by building your own copy of DØScan following the instructions for the current version. Start it as a standard framework package:

```
D0Scan -rcp D0Scan/rcp/D0Scan_test.rcp -  
input_file preco04.single_e_188153828_2000
```

This would bring up an event viewer showing just the ideal MC tracks (in this case a single electron).

We will start by explaining how to manipulate the scene in three dimensions. After that we will discuss how to add (or subtract) content to the scene shown in the viewer.



# Manipulating the Scene

We manipulate the scene using the mouse, the icons on the right side of the viewer, and the thumbwheels.

## The Icons.



Mouse down in the window selects the clicked object.

Mouse down + drag in the window changes the viewpoint.

Help (use the WWW help at top right instead).

Return to the home (starting) view.

Set the home view to the current viewpoint.

View all objects (pan out).

Set clicked object at center and zoom in.

Toggle between perspective and orthographic views (the icon will change to a cube in orthographic view).

## Using the Mouse.

If the icon for the hand is selected, clicking and dragging in the main window will shift your viewpoint as if you were rotating a crystal ball holding the scene.

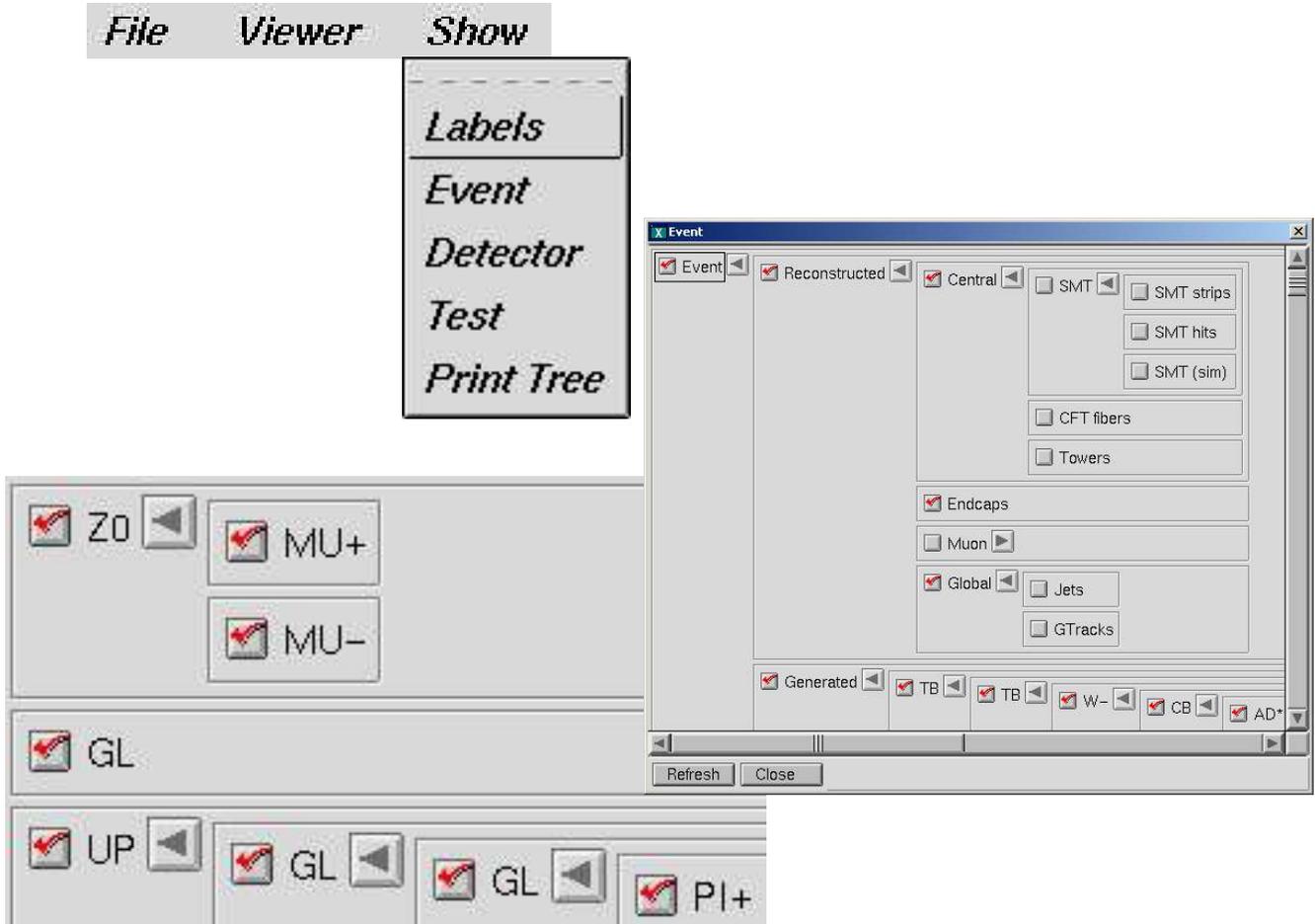
If you hold the control key down while dragging, it translates the scene in the direction of the drag.

Selecting an object (by clicking on the target icon and then clicking on the object in the scene) will reset the center of the scene.

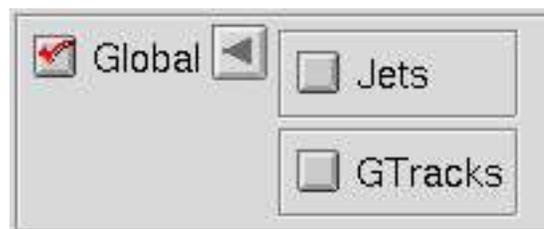
Note that mouse button use may depend on the system and the mouse.

# Selecting What is Displayed

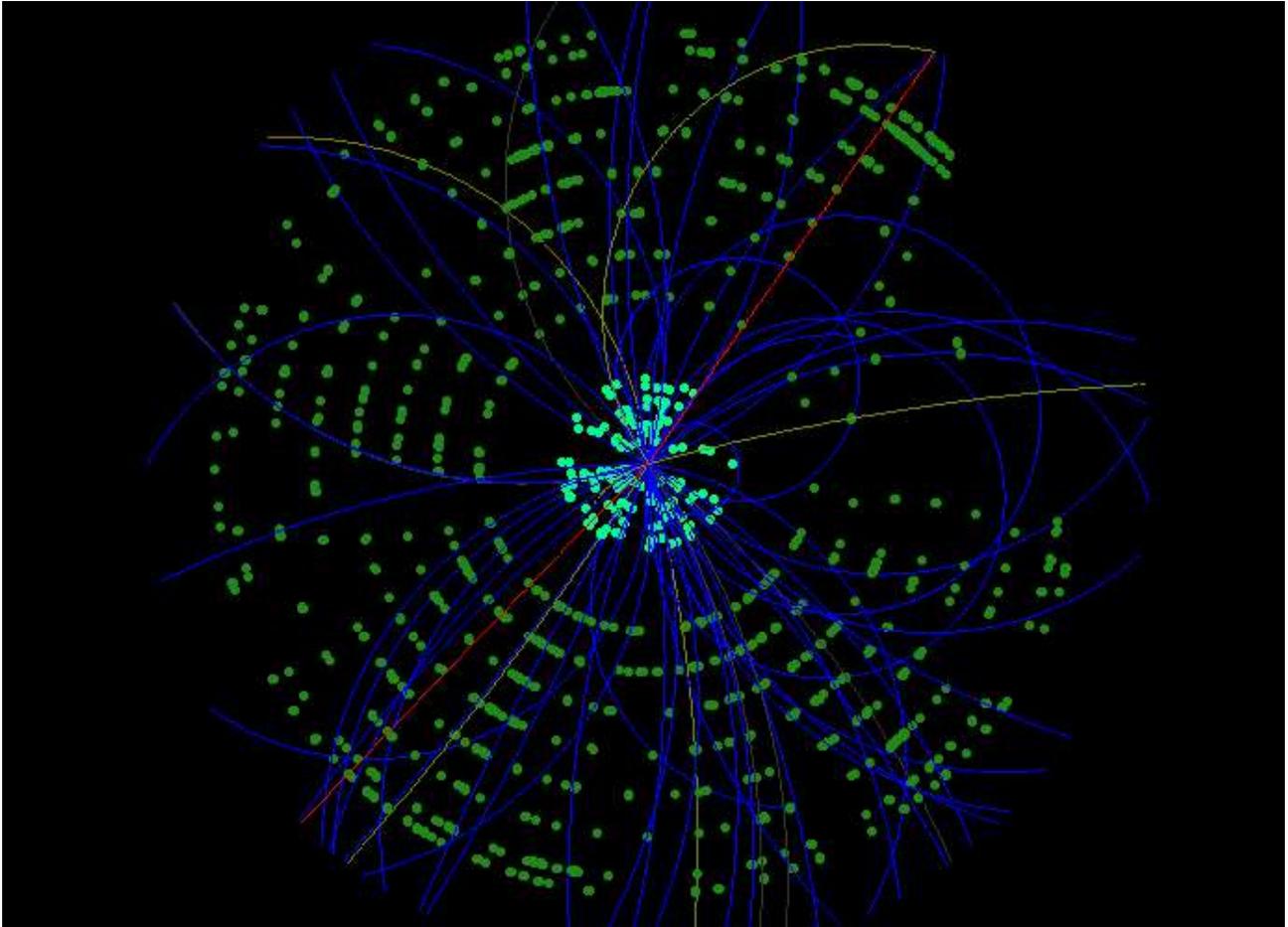
You'll mostly be interested in which pieces of the event get included in the view. Use the pull-down menu from **Show** to get to the **Event** display widget.



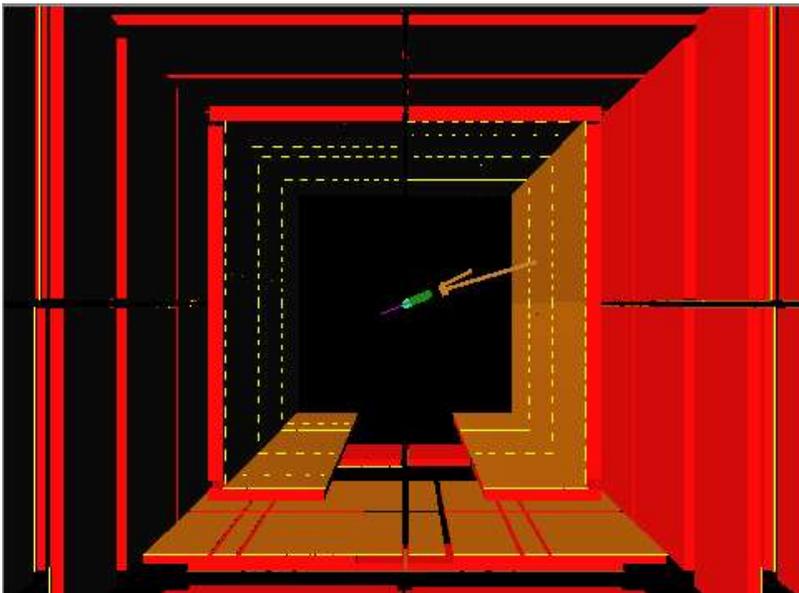
The event pop-up is too big to show full-scale, but we notice that each item is enclosed with a grouping line and includes a checkbox. To be visible, all the checkboxes leading to an item must be checked and the refresh button must be pressed to tell DØScan to modify the contents of the scene. In the following example, the global item is selected, but as neither the jets nor the gtracks is selected, nothing is shown. Note also the triangle next to global. It can be used to collapse everything below the given item so as to save space in the widget.



# What is Currently Available?



This displays the view down the axis with reconstructed SMT hits (cyan), axial CFT fibers (green) and Monte Carlo (idealized) tracks (default colors: muons, red; electrons, green; generic hadrons, blue; protons, gold).

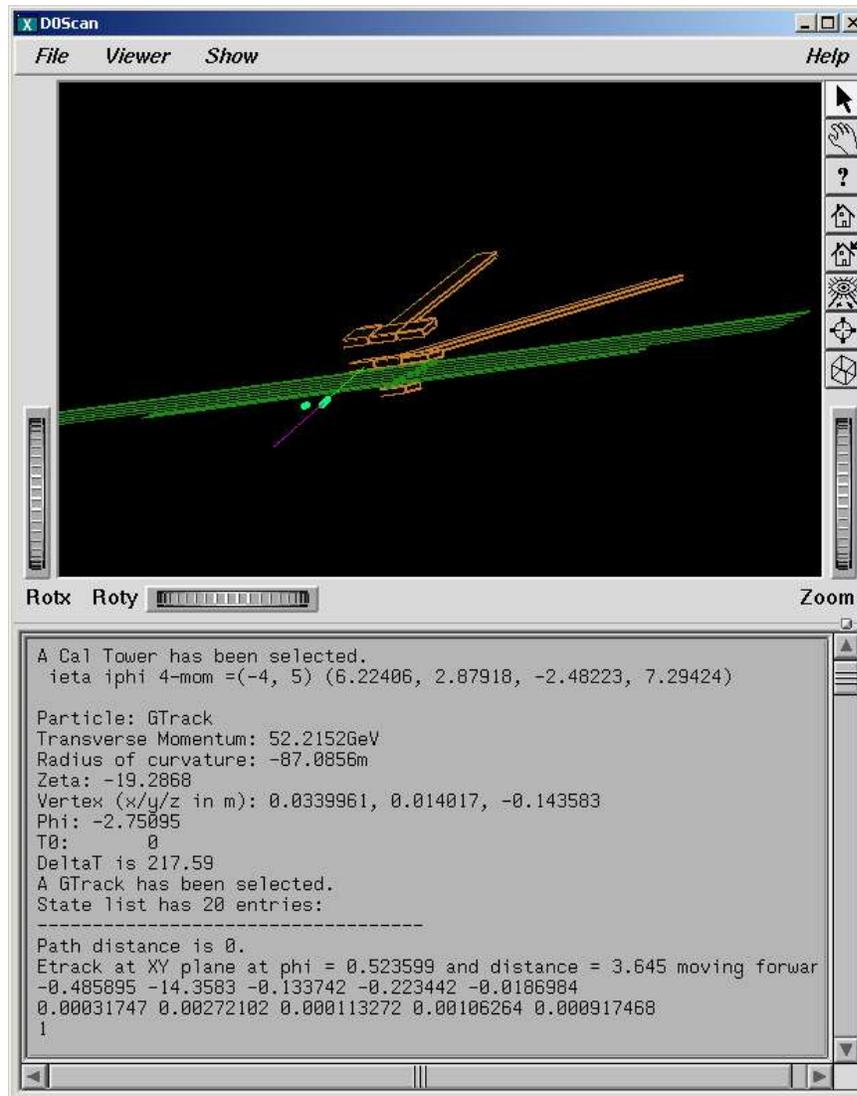


Perspective view of the muon detector (PDT chambers and scintillators) with a single electron event in the tracking and calorimetry.

The disparity of scales in D0 makes the ability to zoom in and out a necessity.

# Picking to Get Information from the Event

Selecting an object in the scene (picking) automatically causes any information available about it to be piped to the scrolling panel below the scene. This is implemented using a very simple-minded algorithm that in most cases just uses the `<<` method of the underlying object. A few of the current objects need additional work.

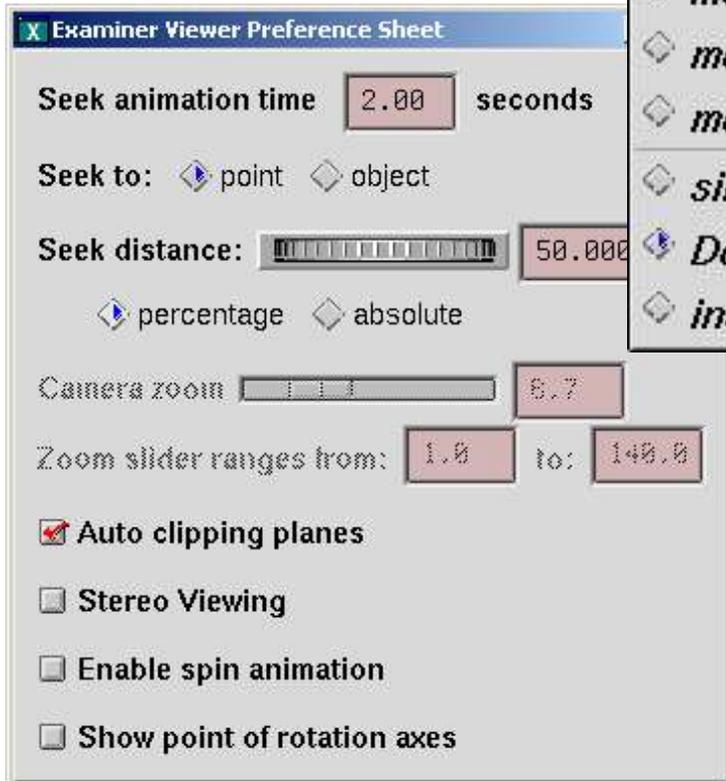
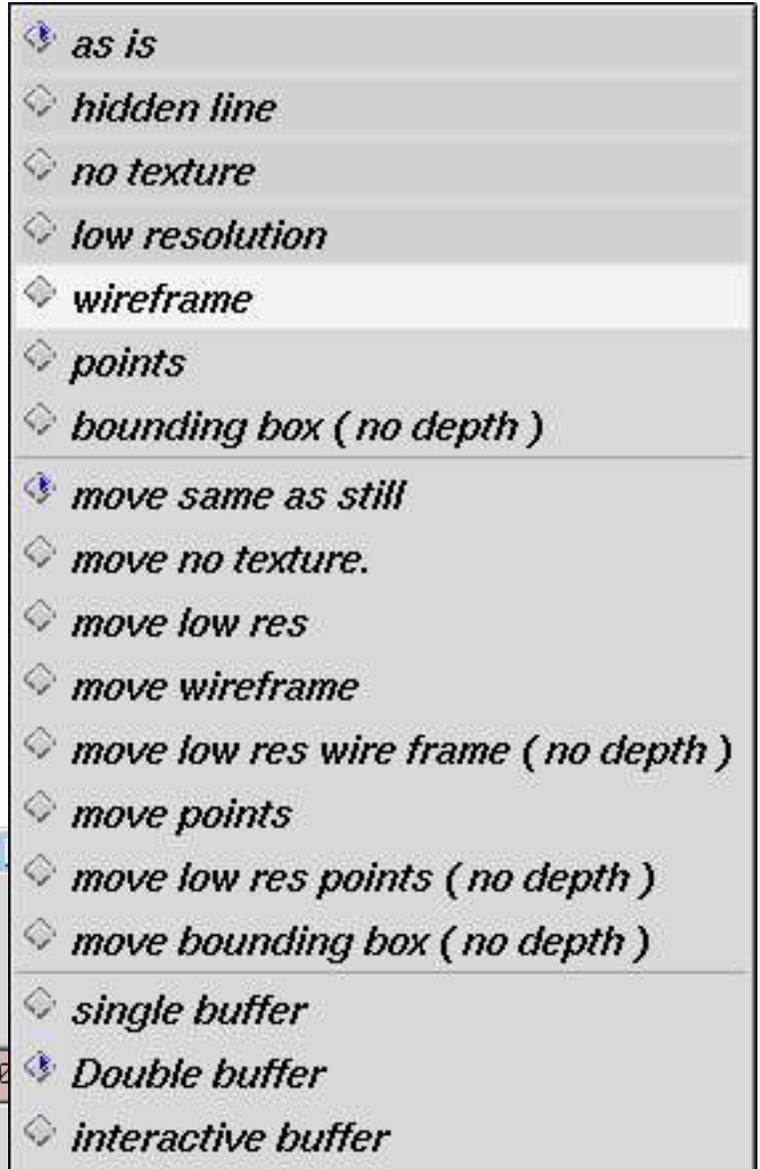
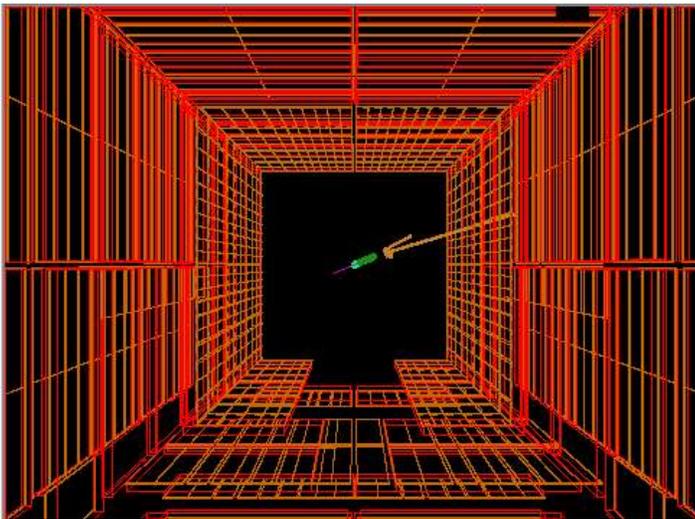


Single electron event showing calorimetry, gtrack, MC track, CFT fibers, SMT hits, and information provided by picking.

# Additional Control

Right clicking in the viewer window will bring up additional menus. Two of them give more control over how you view the scene.

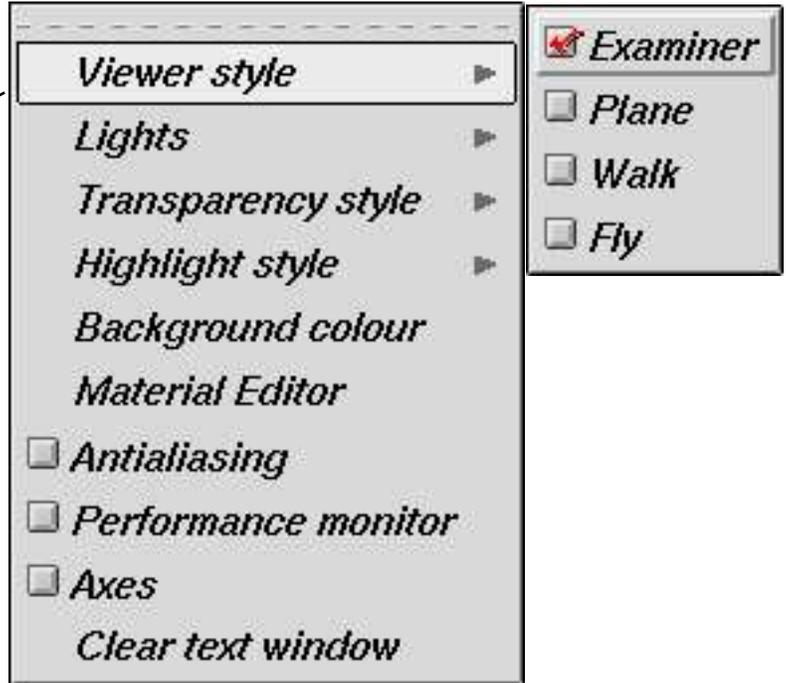
The Draw Style panel lets you view the scene in wireframe. It also lets you choose different styles depending on whether the scene is moving or static.



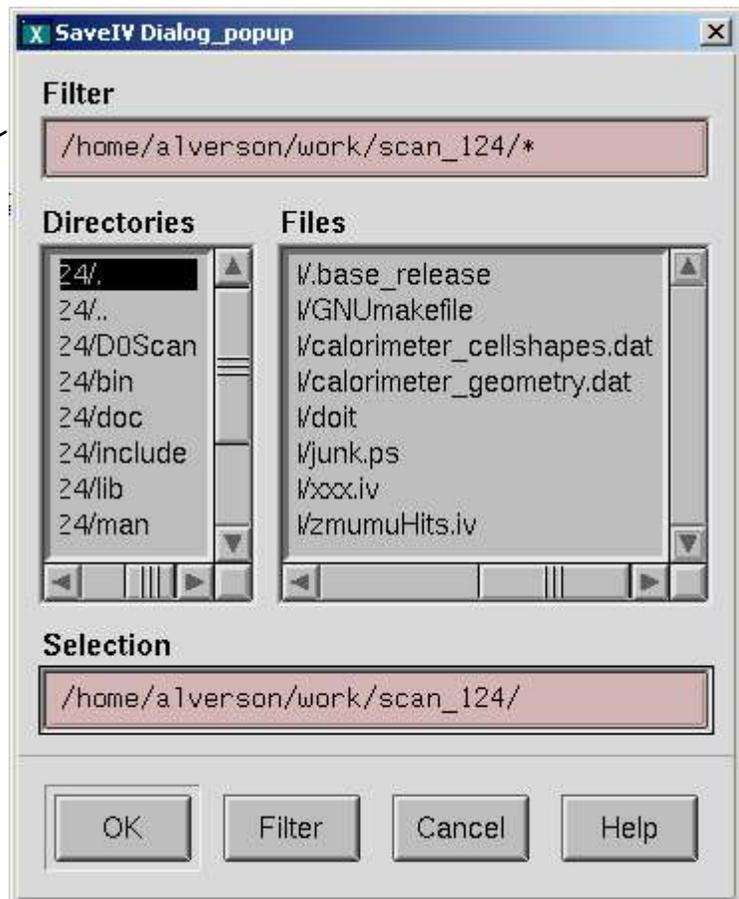
The Preferences Sheet lets you turn off the spin animation, which is annoying when response is slow.

# Miscellaneous

*File* *Viewer* *Show*



Although there are many additional options, the only ones which are commonly used are **New event** and **Save IV**.

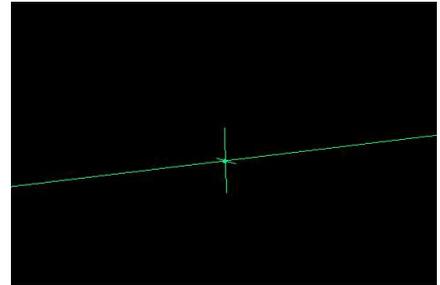


# Information About Non-Obvious Shapes

Most shapes used to represent physical objects are clear as to their meaning: a trajectory is represented by a curved line, a physical chamber is represented by a box. More abstract concepts may lead to trouble, however. In many cases, we've gone to HEPVis to find an appropriate shape that we could use without too much labor. Here are some pointers in their interpretation.

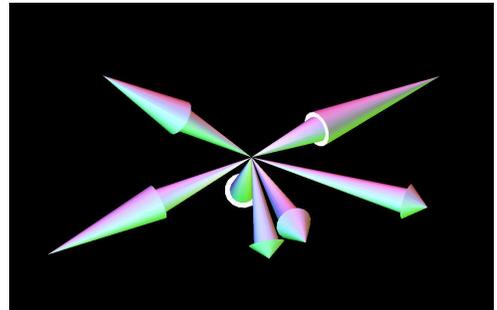
## 3D Errors

You may not notice the error bars on SMT hits since they are so small (we hope!) in terms of the spacing between wafers. If you zoom in close enough you'll begin to see them, however.



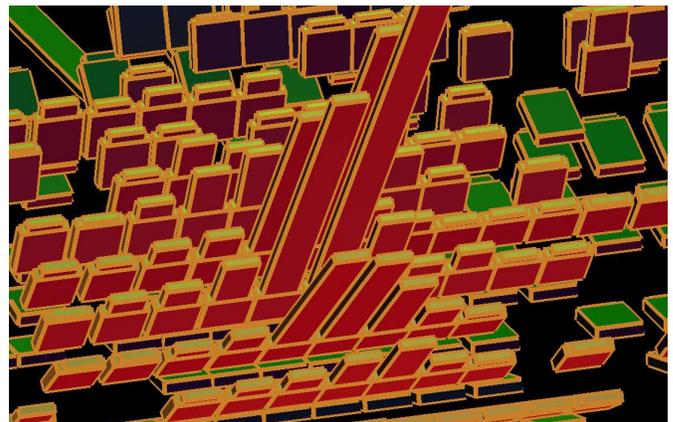
## Jets

The SoJet shape encodes the direction, energy, and thrust of the jet. The fatter the jet shape, the lower the thrust.



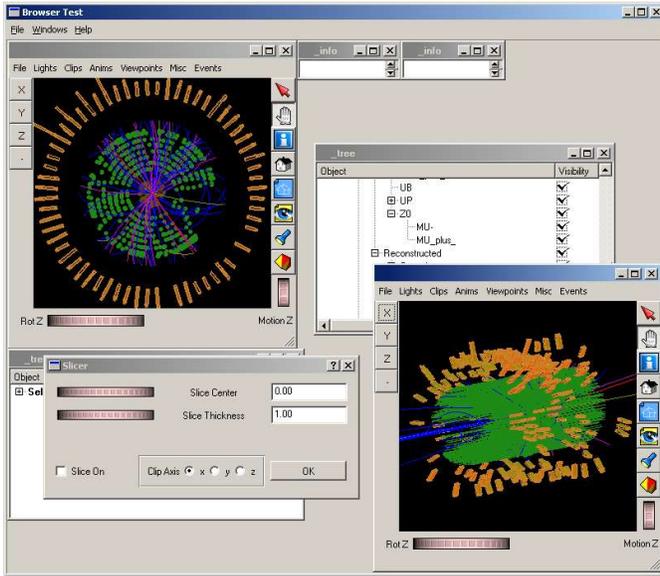
## Calorimeter Hits

Calorimeter hits show the physical shape of the calorimeter cell and then extrude a copy outward in the radial direction which is proportional to the energy deposition. It is slightly shrunk in the transverse direction so you can see the break. Since D0 has focusing towers, but not focusing cells, this results in a somewhat ragged appearance. The first cell in each tower is used as a representation for the tower.



# The MDI Viewer

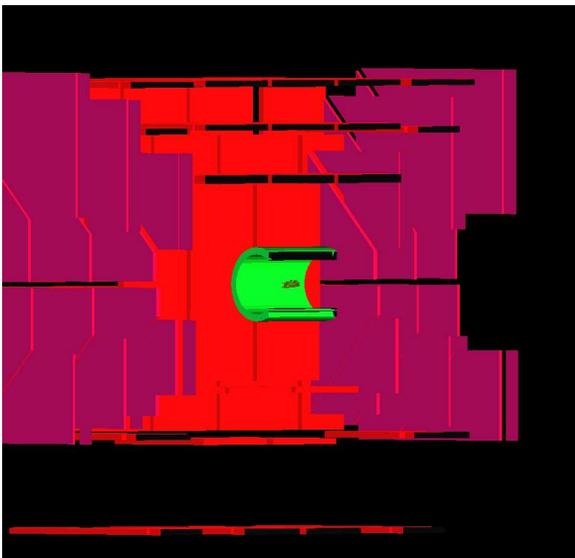
Although work on the present version of D0Scan is continuing, considerable effort is being devoted to the development of a multiple document interface design based on the Qt widget library



Standard MDI interface with two IqQtBrowsers and associated windows showing saved D0 events on Windows.

The Qt library provides for the easy implementation of custom widgets. So far the new design includes

1. Improved lighting control
2. Clip planes to remove sections of the scene
3. Slicing to produce cross section views
4. Animation controls
5. Improved event controls
6. Printing and improved saving
7. Cross selection between the scene and the twig widget
8. 3D/2D viewer allow 3D motion but snaps to axes
9. Available for all Unix systems and Windows (Distribution kit available for standalone NT use now)



D0 detector cut view saved directly to TIF format