

Partiview visualization tool - overview

Try some examples in the `partiview/partiview/examples` folder – hipmotion, hipchroma, sdss, cluster, etc. Under Windows, double-click on the .bat files there; under MacOS or Linux, run the corresponding .sh files. You can examine the partiview scripts used to create each example – some in the subfolder of the same name, others under the “data” folder.

Pointers to other information, software, example data, etc, on partiview are on the web:
<http://virdir.ncsa.illinois.edu/partiview/>

A typical partiview scene is described by a **.cf** file, containing commands to establish settings (brightness, color, placement, etc.), and **reading** one or several **.speck** files which contain 3-D data. Generally a scene includes some set of particles, with each particle having several named numerical attributes (“data variables”).

See the reference documentation, `partiview/partiview/doc/partiview.html` (or `partiview.pdf`). Chapter 3 describes the features of the interface (buttons, sliders, mouse interaction, etc.). Chapter 4 includes descriptions of control and data commands.

Quick orientation:

How to move around in partiview - in the default [o]rbit mode:

- ☒ **Left-mouse-drag** to rotate about the center-point (initially 0 0 0)
- ☒ **Ctrl-left-mouse-drag** to pan across the sky (rotate about the viewpoint), just like fly mode. So most common navigation can be done by staying in orbit mode.
- ☒ **Right-mouse-drag** (or on the Mac, **Option-mouse-drag**) flies into/out-of screen plane, at speed proportional to distance from center-point (i.e. exponentially)
- ☒ Generally, across all [o]rbit/[f]ly/[t]ranslate/[r]otate modes:
 - left-mouse-drag does something in the screen plane** (rotate, translate)
 - right-mouse-drag does something perpendicular to the screen plane** (roll, move forward/backward)
- ☒ **Hold down Shift-key** during left/right-mouse drag => 10x slower for fine control

Things keep moving if the mouse is still moving when you release it. Click to stop.

- ☒ **Middle-mouse-click (or "p" key)** picks object under cursor
=> reports position/name/other info.
- ☒ **Shift-middle-click (or "P" key)** picks object *and* sets **center-point** to be there

Typing commands into the text box:

You can always move mouse to click in text box

Or: press <Tab> key to cycle between the graphics window and the command text box.

So to enter a command, hit <Tab> until the cursor-bar appears in the text box.

Up- and Down-arrow keys scroll through command history.

Some common control-commands

You can type these “control commands” as-is into the partiview text box, e.g.

`color mass` (to derive particle color from a data variable named “mass”)

To put such a control command inside a script (.cf, .speck), you add an “eval” prefix to distinguish it from data:

`eval color mass`

In the below, [brackets] mark something that's optional. So if you see “`censize [size]`” then you might either type “`censize 10`” or just “`censize`”.

`slum` Show current scale-of-luminance value

`slum *2.5` Multiply current slum by this (note no space after “*”)

`datavar` Show names and data-ranges of all named data variables

`lum` Show which data-variable is mapped to luminosity

`color temp 3000 6000` Map “temp” values in range 3000 ... 6000 to color using currently loaded colormap

`jump` Report current viewpoint (camera position)

`jump X Y Z Rx Ry Rz` Set camera position and orientation

`center` Show current center-point coordinates

`center X Y Z` Set center-point (initially 0 0 0)

`censize [size]` Show or set radius of center-point red/green/blue crosshair

`clip [neardistance fardistance]` Shows or sets the “clipping planes,” the range of distances at which things can be seen –

nothing nearer than *neardistance* nor farther than *fardistance*. Initially 0.1 and 2500. May need to be adjusted depending on the scene.

`fovy [degrees]` Views or sets the angular field-of-view.
Also, typing “v” or “V” in the graphics window will enlarge/shrink the field-of-view.

`rdata file-containing-animation-path.wf`
A .wf file describes an animation path – a sequence of camera viewpoints. Each line contains X Y Z Rx Ry Rz FOVY values. Press the “Play” button to play along it, or drag the "play" slider to scan through it, or press the Play button, or...

`frame [frameno]` Jump viewpoint to numbered frame along previously-loaded animation path
`play` Start playing along previously-loaded path

Data-selection commands:

`datavar` List names of data variables (as declared in **.speck** file)

`clipbox xmin,xmax ymin,ymax zmin,zmax`
(note no spaces around commas!!)
Only display particles lying within that box, hiding any others.

`clipbox [off|on]` Leave clipbox position intact but disable/enable clipping.

`thresh varname minvalue-maxvalue`
`thresh varname > minvalue`
`thresh varname > minvalue <maxvalue ...`

Only display specks with those value(s) / ranges

E.g. Hipparcos star data has

mv (apparent V magnitude as seen from Earth), and

colorb_v (B-V color). Then:

`thresh mv < 3` see only stars brighter than magnitude 3;
`thresh colorb_v -0.5 0.1` see only where $-0.5 \leq \text{color} \leq 0.1$

And a data exploration command:

```
hist [-n nbuckets] [-l] varname [min max]
```

Print numerical histogram of values of that variable

(possibly over subsets selected by "clipboard", "only=").

By default, histogram buckets span its entire data range,
unless min max given.

-n: use N histogram buckets (default 11)

-l: use log-spaced buckets (default linear)