Subject: Re: plotting particle data with halos?
Posted by Rick Towler on Fri, 17 Jan 2003 01:43:43 GMT
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"Matt Wood" <wood@astro.nospam.fit.edu>

> I've got particle data generated from 'smoothed particle hydrodynamics'
> code that I'd like to visualize using idl. Are there any routines that
> will plot particles with 'halos' instead of simple colored points?

What exactly do you mean by "halo"? Do you mean that literally, as if the particle were glowing? Or do you mean some sort of trail?

If you mean glowing, there aren't any canned routines for this that I know of but it could be done to some degree in object graphics. I say some degree because you would use alpha blending to create the halo effect and IDL's object graphics renderer is not well suited for this type of rendering (multiple moving alpha textured objects). A lot will depend on how you view things.

Another consideration will be the number of particles you wish to create. At a minimum each particle would be 2d and require 4 vertices in which you would be restricted to a single static view. Practically 8 or 12 verts would be required if you were to "billboard" the texture to view from all angles (I actually don't know how this would render in IDL but am curious to find out). If you want to draw 10k of these things it could get ugly.

If you are still interested I can get you started.

-Rick

Subject: Re: plotting particle data with halos?
Posted by Craig Markwardt on Fri, 17 Jan 2003 04:20:59 GMT
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Matt Wood <wood@astro.nospam.fit.edu> writes:

> I've got particle data generated from 'smoothed particle hydrodynamics'
> code that I'd like to visualize using idl. Are there any routines that
> will plot particles with 'halos' instead of simple colored points? If
> you'd like to see an example of what we're doing, please see
> www.astro.fit.edu/wood/100k34.gif
> It's a simulation of an interacting binary star system that has an
> accretion disk. Color indicates temperature in the disk.

The easiest thing to do might be to plot to the Z buffer, capture it, then convolve with a gaussian, or even simpler, just SMOOTH it. That will give a more smooth look, but of course every point will have the same "halo" size.

However, if you really need variable size smooth particles, then you need to kick it up a notch. You could compute a 2D gaussian for each point, add them to an IDL array one at a time, but that might get pretty computationally expensive. Better might be to make up a library of 2D gaussians and then add those in turn, picking the closest one.

A trick combination of the 1st (convolution) and 2nd (addition of gaussians) approaches would be to sort the points according to their particle size, partition them into a few groups, make plots+convolutions of each using the right particle size, then add them up.

Cool sims! I work on X-ray binaries.

Craig

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Craig B. Markwardt, Ph.D. EMAIL: craigmnet@cow.physics.wisc.edu
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response
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