Subject: Matching volumes and surfaces
Posted by Kenneth P. Bowman on Fri, 20 Jan 2006 02:52:34 GMT
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I have a 2-D data set a(x,y) and a 3-D data set b(x,y,z) that are defined on the same x and y grid.

I'm using iSurface to plot a and iVolume to overplot an isosurface of b in the same display. At the bottom of this message is an example that uses an 11 x 11 grid with data coordinates x, y, and z in the range (0, 10). The arrays a and b have been created so that a should coincide exactly with the isosurface b=0.

After running the commands below, the 2-D surface appears as a yellow plane slicing diagonally upward across the volume cube in the x-direction. Then, I choose Operations...Volume...Isosurface, change the isosurface value to 0.1, and click OK. This renders the b=0.1 isosurface in gray. (Setting the isosurface to 0.1 ensures that the isosurface is slightly above the surface a.)

The resulting image can be seen here

http://csrp.tamu.edu/hiaper/archive/render/rendering.jpg

The rather obvious problem is that the isosurface only covers the ranges x = (0, 9) and y = (0, 9).

Obviously I either don't understand the VOLUME_LOCATION and VOLUME_DIMENSIONS keywords, or I don't understand how the isosurface algorithm works, or I'm making some other mistake (the possibilities are manifold ;-)).

Can anyone steer me to the path of righteous rendering?

Thanks, Ken Bowman

```
n = 11
x = FINDGEN(n)
a = REBIN(x, n, n)

iSurface, a, x, x

xx = REBIN(x, n, n, n)
zz = REBIN(REFORM(x, 1, 1, n), n, n, n)
b  = zz - xx

iVolume, b, /OVERPLOT, $
```

```
VOLUME_LOCATION   = [ 0.0,  0.0,  0.0], $
VOLUME_DIMENSIONS = [10.0, 10.0, 10.0]
```