Subject: Re: spherical harmonic representation Posted by Kenneth P. Bowman on Tue, 21 Jul 2009 14:16:04 GMT View Forum Message <> Reply to Message

In article

<44077862-b715-4e61-a59c-0d4e390c4e6a@r2g2000yqm.googlegroups.com>, maurya <ramaurya98@gmail.com> wrote:

```
Hi everybody,
I want to display spherical harmonics on a sphere, as given on web page:
But, it is not giving results as expected (as given on the above web page).
Can anyone help me.
Thanks
```

There are two immediate errors that I see. Theta is the co-latitude, not the latitude, and should range from 0 to 180, not -90 to 90. If you want to plot the whole sphere, the longitude angle phi should range from 0 to 360 (or -180 to 180), not -90 to 90.

When I fix these things there is still something wrong. The longitudinal variation should be a single wave-5 sinusoid, but it is not. Either I am still missing something, or there is a bug in SPHER_HARM.

(I changed a few details to make it easier for me to understand.)

Ken Bowman

```
l=5 ;harmonic degree
m=2 ;azimuthal order |m| <= I
np = 101 ;No. of inclination angle(theta) and azimuthal angle(phi)

x = 360.0D0*DINDGEN(np)/(np-1) ;phi = 0, 360
y = 180.0D0*DINDGEN(np)/(np-1) ;theta = 0, 180
xx = REBIN(x, np, np)
yy = REBIN(REFORM(y, 1, np), np, np)

ff = real_part(spher_harm(xx*!dtor, yy*!dtor, I, m, /doub))
;ff = IMAGINARY(spher_harm(xx*!dtor, yy*!dtor, I, m, /doub))
```

```
window, 0, xsize = 512, ysize = 512, title = 'Spherical Harmonic'

MAP_SET, /CYLINDRICAL

contour, ff, x, y-90.0, /ove, nlevels=10

isurface, ff, x, y-90.0

end
```

Subject: Re: spherical harmonic representation Posted by Kenneth P. Bowman on Tue, 21 Jul 2009 14:55:33 GMT View Forum Message <> Reply to Message

In article <k-bowman-C664B6.09160321072009@news.tamu.edu>, "Kenneth P. Bowman" <k-bowman@null.edu> wrote:

Had the theta and phi arguments switched. This works.

Ken

```
pro sph_plot
I=5
        ;harmonic degree
         :azimuthal order |m| <= I
m=2
np = 101; No. of inclination angle(theta) and azimuthal angle(phi)
x = 360.0D0*DINDGEN(np)/(np-1)
                                                        ;phi = 0,360
y = 180.0D0*DINDGEN(np)/(np-1)
                                                        ;theta = 0, 180
xx = REBIN(x, np, np)
yy = REBIN(REFORM(y, 1, np), np, np)
ff = real_part(spher_harm(yy*!dtor, xx*!dtor, I, m, /doub))
window, 0, xsize = 512, ysize = 512, title = 'Spherical Harmonic'
MAP_SET, /CYLINDRICAL
contour, ff, x, y-90.0, /ove, nlevels=10
isurface, ff, x, y-90.0
end
```