Subject: SHADE_SURF/MAP_SET compatibility

Posted by Donghui Yi on Fri, 22 Oct 1999 07:00:00 GMT

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I am having a problem getting back to the original lat/lon coordinates from
device coordinates after mapping geographical data with SHADE_SURF.

In detail...

I am trying to use SHADE_SURF to plot a digital elevation model (DEM) of

Antarctica (and other areas), given as a uniformly spaced lat lon grid.

First, MAP_SET was used to define a projection. Then MAP_IMAGE was used to
warp the 2d DEM to an image. Then SHADE_SURF was used to plot the image.

```
THE SEQUENCE OF COMMANDS HERE
map_set, $
      /grid, /continent, /cyl, /isotropic, $
      latCenter, lonCenter, $
      limit=[minLat,minLon,maxLat,maxLon] , $
      e_continents={fill:1}; , color:white}

 imagedem=map_image(datasmall,startx,starty,latmin=minlat,lat max=maxlat, $
            lonmin=minlon,lonmax=maxlon)

set_shading,light=[0,0,1],value=[100,255]
shade_surf,imagedem, image=testt,ax=90,az=0,zrange=[min(datasmall), $
      1.5*max(data small)], xstyle=4,ystyle=4
```

Once the image is on the screen, we want to use the mouse to select a
region for zooming. Knowledge of the lat/lon bounds of the region is
needed
for selection of ancillary data such as satellite ground tracks that
pass
through the region.

The obvious solution to this is to use TV rather than SHADE_SURF, but
I've been asked specifically to produce a map with shaded relief
rather than an image that would be produced by TV.

PROBLEMS:

1. The resolution of the DEM seems to be severely degraded by MAP_IMAGE.

2. SHADE_SURF overrides the coordinate system set up by MAP_SET, so we no
   longer have a way to relate the device coordinates to lat/lon.
3. The size of the array output by SHADE_SURF is not the same size as the
   size of the array given to it -- i.e., after issuing the command.

```
IDL>q=dist(200)
IDL> shade_surf,q,image=p,ax=90,az=0
IDL> help,q,p
Q           FLOAT    = Array[200, 200]
P           BYTE     = Array[393, 295]
```

   P and Q are not the same size.

QUESTIONS:

1. Are there any other ways to plot lat/lon grid dem using SHADE_SURF for
   different projections?
2. Is there a way to force SHADE_SURF to produce an output that is the same
   size as its input?
3. Is there any way to get lat/lon back after using SHADE_SURF?

Regards,

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