Subject: displaying an image in simple geographic coordinates
Posted by Matt[1] on Thu, 24 May 2007 20:44:45 GMT
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does anyone know how i can display an image in simple geographic
coordinates using IDL? all documentation that i have read deals with
reprojection images to various projections or reprojecting a window to
a given image's projection. geographic coordinates is never listed as
an option in any of these functions. maybe it's because i'm dealing
with cartesian coordinates not a projected space per se? but my data
is in lat/lon wgs84 and i need to plot point data that is in decimal
degrees (wgs84) as well. any suggestions?

matt

Subject: Re: displaying an image in simple geographic coordinates
Posted by James Kuyper on Fri, 25 May 2007 20:54:14 GMT
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Matt wrote:
> does anyone know how i can display an image in simple geographic
> coordinates using IDL? all documentation that i have read deals with
> reprojection images to various projections or reprojecting a window to
> a given image's projection. geographic coordinates is never listed as
> an option in any of these functions. maybe it's because i'm dealing

In IDL, the default projection is cylindrical, which is (almost) the
same thing as what you're calling geographic coordinates. In this
projection, the x coordinate is the longitude in radians, and the y
coordinate is the latitude in radians.

IDL> map_set, /continents, /grid
IDL> print,map_proj_forward([-90,90],[-45,45])*!RADEG
    -89.999995   -44.999998
     89.999995   44.999998

You can also use MAP_PROJ_INIT, but you have to override the default
sphere radius:

IDL> proj = MAP_PROJ_INIT('Equirectangular', SPHERE_RADIUS=1.0)
IDL> print,map_proj_forward([-90,90],[-45,45],map_structure=proj) *!
RADEG
    -89.999995   -44.999998
     89.999995   44.999998

Alternatively, you could simplify by building the conversion factor
into the projection itself:

```
IDL> proj = MAP_PROJ_INIT('Equirectangular', SPHERE_RADIUS=!RADEG)
IDL> print,map_proj_forward([-90,90],
[-45,45],map_structure=proj)
    -89.999995    -44.999998
     89.999995     44.999998
```

Subject: Re: displaying an image in simple geographic coordinates
Posted by Matt[1] on Tue, 29 May 2007 15:19:47 GMT
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Any reason why my !RADEG values appear to be different than the ones
posted above? When I run the same commands I get different results:

```
IDL> map_set, /continents, /grid
IDL> print,map_proj_forward([-90,90],[-45,45])*!RADEG
    -90.000001    -45.000001
     90.000001     45.000001
```

Not a huge difference but it seems to me like the conversion factor
should be the same, right?

Matt

Subject: Re: displaying an image in simple geographic coordinates
Posted by James Kuyper on Tue, 29 May 2007 17:36:18 GMT
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Matt wrote:
> Any reason why my !RADEG values appear to be different than the ones
> posted above? When I run the same commands I get different results:
>
> IDL> map_set, /continents, /grid
> IDL> print,map_proj_forward([-90,90],[-45,45])*!RADEG
>   -90.000001   -45.000001
>   90.000001   45.000001
>
> Not a huge difference but it seems to me like the conversion factor
> should be the same, right?

This looks like a floating point round-off error to me. See <http://
www.dfanning.com/math_tips/sky_is_falling.html> for relevant
information. We are probably running on different platforms. I
performed that test on my Linux desktop machine; where "uname -srvmp"
gives:

Linux 2.4.21-47.EL #1 Tue Aug 1 08:56:24 EDT 2006 i686 i686

If you're using a different platform, then it's quite feasible for
your round-off errors to be a little different from the ones I get on
my machine.