Subject: Re: Transverse cylidrical map projection.
Posted by Liam E. Gumley on Thu, 23 Mar 2000 08:00:00 GMT

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James Kuyper <kuyper@wizard.net> wrote in message
news:38DA1B88.7A690089@wizard.net...
> I want to plot data using a transverse cylindrical map projection. An
> equal-area one would be best, but equidistant or mercator would be
> almost as good, just so as long as it's transverse version of one of the
> cylindrical projections. MAP SET accepts a tilt angle, which doesn't do
> what I want for most of the cylindrical projections. The user's guide
> contains an example command:
>
       map_set,0,0,45,londel=20,latdel=20,/grid,$
>
       /continent,/cyl,title='Oblique Cylindrical Equidistant'
>
>
 which is shown in the book as producing a map with the projection axis
> tilted by 45 degrees: the lines of constant latitude and longitude are
> curved. When I try it, I get a map tilted by 45 degrees, which is a very
> different thing: The lines of constant latitude and longitude are
> strait, tilted by 45 degrees. This suggests that the book was printed
> using a different (hopefully later) version of IDL than I'm using. I saw
> the problem first in version 5.0.3, but I've recently discovered where
> they've hidden version 5.2 on our machine, and I still see the same
> results using it.
>
> Luckily, I've found that the transverse mercator projection does
> implement the tilt properly. However, in large maps it often considers
> one or more of my limit points unmappable, for reasons that escape me.
> For example,
> map set,-15.7970,-90.4190,260.1820, limit=[78.548,-31.494, $
> -27.66,-64.441, -64.066,103.55, -0.792,-114.296],$
 /continents,/grid,/label,/isotropic,/transverse_mercator
>
> Produces the complaints:
> % MAP_SET_LIMITS: Unmappable limit point:
                                                     -31.4940
                                                                 78.5480
> % MAP SET LIMITS: Unmappable limit point:
                                                     103.550
                                                                 -64.0660
>
  The only points that should be unmappable in a mercator projection are
> points near the projection axis, and of the four points I gave, those
  two are the ones farthest from the axis.
If you use /lambert instead of /transverse_mercator, you'll get a feel
> for the kind of plot I want. /stereo and /azimuthal also work, each with
> their own distortion properties. However, I want a cylindrical
```

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> quite what I want.

> projection, not an azimuthal one - the projection properties aren't

James,

I haven't bothered with the LIMIT keyword to MAP\_SET since I discovered the SCALE keyword:

```
map_set, -15.7970, -90.4190, 260.1820, /transverse, scale=50e6 map_continents, /hires map_grid, /label
```

The map is always isotropic, and it always fills the current display. You usually need to experiment a little with the scale factor, but it beats trying to guess map limits.

Cheers, Liam.

Subject: Re: Transverse cylidrical map projection.
Posted by James Kuyper on Fri, 24 Mar 2000 08:00:00 GMT
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## Liam Gumley wrote:

>

- > James Kuyper <kuyper@wizard.net> wrote in message
- > news:38DA1B88.7A690089@wizard.net...
- >> I want to plot data using a transverse cylindrical map projection. An
- >> equal-area one would be best, but equidistant or mercator would be
- >> almost as good, just so as long as it's transverse version of one of the
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- >> what I want for most of the cylindrical projections. The user's guide
- >> contains an example command:

>> >>

map\_set,0,0,45,londel=20,latdel=20,/grid,\$
/continent,/cyl,title='Oblique Cylindrical Equidistant'

>> >>

- >> which is shown in the book as producing a map with the projection axis
- >> tilted by 45 degrees: the lines of constant latitude and longitude are
- >> curved. When I try it, I get a map tilted by 45 degrees, which is a very
- >> different thing: The lines of constant latitude and longitude are
- >> strait, tilted by 45 degrees. This suggests that the book was printed
- >> using a different (hopefully later) version of IDL than I'm using. I saw
- >> the problem first in version 5.0.3, but I've recently discovered where
- >> they've hidden version 5.2 on our machine, and I still see the same
- >> results using it.

>>

- >> Luckily, I've found that the transverse mercator projection does
- >> implement the tilt properly. However, in large maps it often considers

It turns out I was mistaken. In both cases, it was tilting the map, rather than the axis of the projection.

```
>> one or more of my limit points unmappable, for reasons that escape me.
>> For example,
>>
>> map_set,-15.7970,-90.4190,260.1820, limit=[78.548,-31.494, $
>> -27.66,-64.441, -64.066,103.55, -0.792,-114.296],$
>> /continents,/grid,/label,/isotropic,/transverse mercator
>>
>> Produces the complaints:
>> % MAP_SET_LIMITS: Unmappable limit point:
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                                                              -64.0660
> James.
>
> I haven't bothered with the LIMIT keyword to MAP SET since I discovered the
> SCALE keyword:
>
> map set, -15.7970, -90.4190, 260.1820, /transverse, scale=50e6
> map continents, /hires
> map_grid, /label
>
```

- > The map is always isotropic, and it always fills the current display. You
- > usually need to experiment a little with the scale factor, but it beats
- > trying to guess map limits.

I don't want to do it that way. I'm conveying an extra level of information by my choice of boundaries; they corresponding to the farthest distance the satellite could see in each direction at any time during the data collection, if it had been pointed in that direction. This provides a context for displaying the images it saw in the direction it was actually pointing.

In any event, I resolved the problem. The feature I wanted is controlled by the 'central\_azimuth' parameter, rather than by the 'rot' parameter. Looking at their descriptions, I can't figure out why they work the way they do. 'rot' has basically the effect I would expect given the description of 'central\_azimuth', and vice-versa. Once I figured out the correct central\_azimuth angle, MAP\_SET had no problems with my limit points.