
Subject: Re: Another Map Projection Problem with Map_Proj_Init
Posted by [David Fanning](#) on Tue, 06 Dec 2011 00:43:12 GMT
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David Fanning writes:

```
> I have discovered another map projection problem this morning.
> It seems Map_Proj_Init is calculating incorrect UV ranges
> (they are wrong by 10 degrees) when the center latitude is
> not 0.0. Here is a short test program:
>
> FOR j=0,10 DO BEGIN
>   center_lon = 0 > j*36.0d < 360.0
>   mapStruct = Map_Proj_Init(117, CENTER_LONGITUDE=center_lon)
>   print, center_lon, mapStruct.uv_box[[0,2]]
>
>   ll = Map_Proj_Inverse(mapStruct.uv_box[[0,2]], $
>     mapStruct.uv_box[[1,3]], MAP_STRUCTURE=mapStruct)
>   print, center_lon, ll[0,0], ll[0,1]
>   print, ""
> ENDFOR
> END
>
> Here are the results. The numbers should be symmetric,
> but you can see they are not.
>
>   0.000000   -20015077.    20015077.
>   0.000000    180.00000   -180.00000
>
>   36.0000   -19570298.    19347908.
>   36.0000   -140.00000   -150.00000
>
>   72.0000   -19125518.    19792688.
>   72.0000   -100.00000   -110.00000
>
>   108.000   -19792688.    19125518.
>   108.000   -70.000000   -80.000000
>
>   144.000   -19347908.    19570298.
>   144.000   -30.000000   -40.000000
>
>   180.000   -20015077.    18903129.
>   180.000    0.00000000   -10.000000
>
>   216.000   -19570298.    19347908.
>   216.000    40.000000    30.000000
>
>   252.000   -19125518.    19792688.
```

```
> 252.000 80.000000 70.000000
>
> 288.000 -19792688. 19125518.
> 288.000 110.00000 100.00000
>
> 324.000 -19347908. 19570298.
> 324.000 150.00000 140.00000
>
> 360.000 -20015077. 20015066.
> 360.000 180.00000 179.99990
>
> I couldn't figure out why my grid lines were always getting
> screwed up when I calculated them using the UV range! :-)
```

It turns out, according to the folks in technical support, that to get correct UV_BOX values from Map_Proj_Init you MUST use the LIMIT keyword, even (well, *especially*) if you don't plan to limit the map projection in any way.

Another way to say this is that if you plan to use Map_Proj_Init and set the CENTER_LONGITUDE to anything other than 0, you MUST also use the LIMIT keyword to produce correct results. This is, as you might expect, not documented. :-)

I've updated my cgMap object to handle the problem correctly.

Cheers,

David

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David Fanning, Ph.D.
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Coyote's Guide to IDL Programming: <http://www.idlcoyote.com/>
Sepore ma de ni thui. ("Perhaps thou speakest truth.")
