
Subject: Plot curved line on a globe projection
Posted by [Sir Lojn Steak](#) on Sun, 28 Jul 2013 18:19:21 GMT
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Hi all,

I want to plot some straight line sections on a gridded globe plot (i.e. a line joining two points with different lat/lon coordinates), but want these lines to follow the curve of the globe.

I did a test (which I thought would work!) using the following code, but it just plots a straight line:

```
;Coordinates etc
latcentre = 30
loncentre = 0
angle = 0

;Plot globe
set_plot, 'ps'
!p.font=0
device, /encap, xsize=6, ysize=6, /inches
loadct, 0
map_set, latcentre, loncentre, angle, $
    /orthographic, /isotropic, /grid, /horizon, /noborder
map_grid, latdel=5, londel=5, glinestyle=0, glinethick=0.5, color=cgcolor('black')
oplot, [10,30], [30,50], color=cgcolor('black')
device, /close
```

Can anyone offer any help? Is there anything simple I'm missing? I've searched online, but only seem to be able to find posts related to contouring on globe plots.

Many thanks,

Liam

Subject: Re: Plot curved line on a globe projection
Posted by [David Fanning](#) on Sun, 28 Jul 2013 19:16:49 GMT
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ljs15@fsmail.net writes:

```
> I want to plot some straight line sections on a gridded globe plot (i.e. a line joining two points
with different lat/lon coordinates), but want these lines to follow the curve of the globe.
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> loncentre = 0
> angle = 0
>
> ;Plot globe
> set_plot, 'ps'
> !p.font=0
> device, /encap, xsize=6, ysize=6, /inches
> loadct, 0
> map_set, latcentre, loncentre, angle, $
>     /orthographic, /isotropic, /grid, /horizon, /noborder
> map_grid, latdel=5, lonel=5, glinestyle=0, glinethick=0.5, color=cgcolor('black')
> oplot, [10,30], [30,50], color=cgcolor('black')
> device, /close
>
> Can anyone offer any help? Is there anything simple I'm missing? I've searched online, but only
seem to be able to find posts related to contouring on globe plots.

```

You can use Map_2Points to get the points making up a great circle route, but there won't be much difference. Here is an example. The green line is a straight line, the red is equally spaced in distance, and the blue is equally spaced in longitude.

```

;Coordinates etc
latcentre = 30
loncentre = 0
angle = 0

;Plot globe
;set_plot, 'ps'
;!p.font=0
;device, /encap, xsize=6, ysize=6, /inches
cgdisplay, 600, 600
loadct, 0
cgmap_set, latcentre, loncentre, angle, limit=[30, 0, 50, 40], $
    /orthographic, /isotropic, /horizon, /noborder
cgmap_grid, latdel=5, lonel=5, glinestyle=0, glinethick=0.5
cgPlotS, [10,30], [30,50], Color='grn7'; Straight line.
cgPlotS, Map_2Points(10, 30, 30, 50, DPath=1, NPath=50), $
    Color='red' ; Evenly spaced in distance
cgPlotS, Map_2Points(10, 30, 30, 50, /RHUMB, NPath=50), $
    Color='blue' ; Evenly spaced in longitude.
;device, /close
END

```

Cheers,

David

--

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

Subject: Re: Plot curved line on a globe projection
Posted by [Sir Loin Steak](#) on Sun, 28 Jul 2013 20:00:45 GMT
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On Sunday, 28 July 2013 20:16:49 UTC+1, David Fanning wrote:

> ljs15@fsmail.net writes:

>

>

>

>> I want to plot some straight line sections on a gridded globe plot (i.e. a line joining two points with different lat/lon coordinates), but want these lines to follow the curve of the globe.

>

>>

>

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>

>>

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>> ;Coordinates etc

>

>> latcentre = 30

>

>> loncentre = 0

>

>> angle = 0

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>>

>

>> ;Plot globe

>

>> set_plot, 'ps'

>

>> !p.font=0

>

>> device, /encap, xsize=6, ysize=6, /inches

>

>> loadct, 0

>

>> map_set, latcentre, loncentre, angle, \$

```
>
>> /orthographic, /isotropic, /grid, /horizon, /noborder
>
>> map_grid, latdel=5, loncel=5, glinestyle=0, glinethick=0.5, color=cgcolor('black')
>
>> oplot, [10,30], [30,50], color=cgcolor('black')
>
>> device, /close
>
>>
>
>> Can anyone offer any help? Is there anything simple I'm missing? I've searched online, but
only seem to be able to find posts related to contouring on globe plots.
>
>
>
> You can use Map_2Points to get the points making up a great circle
>
> route, but there won't be much difference. Here is an example. The green
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> line is a straight line, the red is equally spaced in distance, and the
>
> blue is equally spaced in longitude.
>
>
>
> ;Coordinates etc
>
> latcentre = 30
>
> loncentre = 0
>
> angle = 0
>
>
>
> ;Plot globe
>
> ;set_plot, 'ps'
>
> ;!p.font=0
>
> ;device, /encap, xsize=6, ysize=6, /inches
>
> cgdisplay, 600, 600
>
> loadct, 0
>
```

```

> cgmap_set, latcentre, loncentre, angle, limit=[30, 0, 50, 40], $
>
> /orthographic, /isotropic, /horizon, /noborder
>
> cgmap_grid, latdel=5, loncel=5, glinestyle=0, glinethick=0.5
>
> cgPlotS, [10,30], [30,50], Color='grn7'; Straight line.
>
> cgPlotS, Map_2Points(10, 30, 30, 50, DPath=1, NPath=50), $
>
> Color='red' ; Evenly spaced in distance
>
> cgPlotS, Map_2Points(10, 30, 30, 50, /RHUMB, NPath=50), $
>
> Color='blue' ; Evenly spaced in longitude.
>
> ;device, /close
>
> END
>
>
> Cheers,
>
>
> David
>
>
>
>
> --
>
> David Fanning, Ph.D.
>
> Fanning Software Consulting, Inc.
>
> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
>
> Sepore ma de ni thue. ("Perhaps thou speakest truth.")

```

Thanks David, that's just what I was after. I was actually wanting to plot a line with a large change in lat/lon, so the difference between a great circle and straight line is noticeable.

On a similar topic, does anyone know of a method which would allow a circle to be plotted on a globe, from a specification of the central lat/lon location and the radius?

I'm currently looking through the coyote routines and online, but if anyone knows off-hand a way of doing it, please let me know!

Thanks,

Liam

Subject: Re: Plot curved line on a globe projection
Posted by [David Fanning](#) on Sun, 28 Jul 2013 20:36:53 GMT
[View Forum Message](#) <> [Reply to Message](#)

ljs15@fsmail.net writes:

> On a similar topic, does anyone know of a method which would allow a circle to be plotted on a globe, from a specification of the central lat/lon location and the radius?

In general, the way this would be done is to work in projected meter space, not lat/lon space. Then, the equation of a circle is trivial. If you **have** to plot in lat/lon you can inverse transform your circle points from projected meter space to lat/lon space.

The cgMap object always works in projected meter space. :-)

Cheers,

David

--

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

Subject: Re: Plot curved line on a globe projection
Posted by [Sir Loin Steak](#) on Sun, 28 Jul 2013 20:45:32 GMT
[View Forum Message](#) <> [Reply to Message](#)

On Sunday, 28 July 2013 21:36:53 UTC+1, David Fanning wrote:

> ljs15@fsmail.net writes:

>
>
>

>> On a similar topic, does anyone know of a method which would allow a circle to be plotted on a globe, from a specification of the central lat/lon location and the radius?

>
>
>
> In general, the way this would be done is to work in projected meter
> space, not lat/lon space. Then, the equation of a circle is trivial. If
> you *have* to plot in lat/lon you can inverse transform your circle
> points from projected meter space to lat/lon space.

>
>
>
> The cgMap object always works in projected meter space. :-)

>
>
>
> Cheers,

>
>
> David

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> --

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

Thanks again David. I'll give that a go.

I thought I'd struck gold with the ellipse function (<http://www.exelisvis.com/docs/ELLIPSE.html>), but it appears my idl package doesn't know what this is!