
Subject: Re: circles on the sky

Posted by [JDS](#) on Tue, 07 Apr 2009 14:17:37 GMT

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On Mar 31, 6:27 pm, Christopher Thom <ct...@oddjob.uchicago.edu>
wrote:

> Quoth Paolo:

>

>

>

>> Christopher Thom wrote:

>>> Quoth Kenneth P. Bowman:

>

>>>> In article <alpine.OSX.1.10.0903311335490.8...@kanangra.uchicago.edu>,

>>>> Christopher Thom <ct...@oddjob.uchicago.edu> wrote:

>

>>>> > Given a co-ordinate position (ra/dec or lat/long), a direction (e.g an

>>>> > angle east of north, for instance), and a great circle angular distance,

>>>> > how do I compute the coordinate of the final position?

>

>>>> LL_ARC_DISTANCE.

>

>>>> What! That wasn't obvious? :-)

>

>>>> (This function should be referenced in the manual page for MAP_2POINTS,
>>>> and vice versa.)

>

>>> AHA!!! Missed this one. Now, by just passing all azimuths 0 -> 360deg, i

>>> have the coordinates of the "circles" i'm trying to draw (where, by

>>> "circle", i mean "the set of all points that are r distance from my

>>> lon/lat").

>

>> Is that significantly different than a circle with radius r drawn

>> in the projected map, if r is about 0.5 degree as you said

>> in the original post?

>

> Well...I think so. Map projections continually confuse me, and getting
> them right in IDL confuses me even more! what I can say for sure is this:

>

> If i just calculate a cartesian circle, using the following code:

>

> theta = findgen(361)/!DRADEG

> xx = x0 + r*cos(theta)

> yy = y0 + r*sin(theta)

> plot, x0, y0

> oplot, xx, yy

>

> I get a very circular object in my plots, both on an equirectangular plot

> of points, as well as a projected map, made using map_set.
>
> BUT...if i now calculate the great circle distance to each of the 361
> points in my cartesian circle from the centre of the circle, the distance
> is NOT constant, as I expect. Rather, it is sinusoidal, approaching r at
> the maximum of the curve.

That's not surprising. Only certain projections preserve shape in the 2D plane. Conformal projections like Mercator are among them (but in that case relative areas are not preserved: the Greenland effect).

JD
