Subject: Re: circles on the sky
Posted by pgrigis on Tue, 31 Mar 2009 22:45:57 GMT
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Christopher Thom wrote:
> Quoth Paolo:
>
>> Christopher Thom wrote:
>>> Quoth Kenneth P. Bowman:
>>>
>>>> In article <alpine.OSX.1.10.0903311335490.8491@kanangra.uchicago.edu>,
>>>> Christopher Thom <cthom@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 yous 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.
>
> OTOH, using ll_arc_distance gives me a rather egg-like "circle", but at
> least the distance from the centre to all the points on my "circle" is
> constant (i.e. r), as expected.

Well, I tried:

```
;go to the equator at central meridian
x=0
y=0

;0.5 degrees distance
arc_dist=0.5/360*!Pi*2

;define azimuts from 0 to 2Pi
az=findgen(100)/99*2*!Pi

;result coordinates
resx=az*0
resy=az*0

;ll_arc_distance seems not to be vectorized?
;or maybe I misread the docs
.run
FOR i=0,n_elements(az)-1 DO BEGIN
  res=ll_arc_distance([x,y],arc_dist,az[i])
  resx[i]=res[0]
  resy[i]=res[1]
ENDFOR
end

;plot result coordinates
plot,resx,resy,/iso
;looks very circular to me
```

I did not do map projections because I'd like to keep
what remains of my sanity :) but I don't expect them
to distort that circle too much...

Ciao,
Paolo

>
> I must have spent 2 or 3 days digging through my code, convinced that I
> must have screwed up the object locations, rather than just the "drawing a

> circle" part.
>
> cheers
> chris
