Subject: Re: circles on the sky
Posted by wlandsman on Sun, 29 Mar 2009 23:18:24 GMT
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On Mar 27, 1:53 pm, Christopher Thom <ct...@oddjob.uchicago.edu>
wrote:
> Hi all,
>
> I'm drawing some points on a sky map. The map is <0.5deg across, so I
> thought a flat approximation would be ok...this may not be true. Around my
> central point, I draw a circle using a flat geometry relation [x =
> x0+r*cos(theta); y = y0 + r*sin(theta)], but i see a point outside the
> circle that I expect to be inside.
>
> I expect this point to be inside the circle, because the radius of the
> circle (in arcsec) is *greater* than the great-circle angular distance
> from the centre of the circle to the point.
>
> So...I'm thinking that my flat-geometry assumption is false. My question:
> can anyone point me towards forumlae/code that will calculate this circle
> on the sky (i.e. all points which have a fixed great-circle distance from
> the centre)? I'm using the astro library gcirc.pro to calculte my
> great-circle angular distances...I kind of want the "inverse" of that
> routine, I guess.
>
> Or...is there a better way to do it? [Or maybe my bug is elsewhere?]
>
> cheers
> chris

One thing that is unclear in this question is whether you are talking
about the surface of a sphere (in which case spherical trig formulae
like in gcirc.pro are appropriate) or a projection onto a flat map.
You begin by saying that you are drawing points on a map. In that
case you need to know what projection you are using to create the flat
map (e.g. gnomomic? Mercator?). Once you specify the projection
(e.g. with MAP_INIT) then you can use MAP_PROJ_FORWARD /
MAP_PROJ_INVERSE to convert between X,Y and spherical coordinates.
(In astronomy you would use the world coordinate system routines
wcssph2xy / wcsxy2sph).

--Wayne