Subject: Further adventures in POLAR_CONTOUR
Posted by John Coxon on Wed, 29 Feb 2012 11:54:15 GMT
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So I wanted to plot two POLAR_CONTOUR plots on the same graph. It will be useful, below, to know that the colour table I am using has values 1-4 as dark blue to light blue, values 5 and 6 as white, and values 7-10 as light red to dark red:

```
ctable =
 [[0,0,60,120,180,255,255,255,255,255,255],[0,0,60,120,180,25
5,255,180,120,60,0],[0,255,255,255,255,255,255,180,120,60,0] ]
```

I have data for current density in the Earth's ionosphere that goes between -1.0 and 1.0 muA/m^2, and I was plotting this in intervals of 0.2 per contour (so at -1.0, -0.8, .. 0.6, 0.8) with the -0.2 and 0.0 levels set to 5 and 6 (so that any data between -0.2 and 0.2 muA/m^2 was not plotted). A value of -1.0 is coloured with dark blue (1) and a value of 1.0 was plotted with dark red (10).

However, since then, it has become apparent that it would be useful to put the contours above some lines that denote the co-ordinate system, and so I began to experiment with putting two separate contour plots on top of those lines. (I now know, thanks to David, that /cell_fill doesn't ruin my fills in the way I thought it did, so this has become easier and more elegant within the last few minutes!)

I start with:

```
plot,[-30,30],[-30,30],xstyle = 5,ystyle = 5,position =
[0.09,0.3,0.49,0.86],/nodata
```

I then use OPLOT in two iterative loops to plot some lines on this invisible plot area before diving into some POLAR_CONTOURing.

```
polar_contour,current,mltrad,colat,xrange = [-30,30],xtickname =
colatitudes,xtitle = 'Colatitude [' + deg_sign + '] (MLT = 18 (-ve) & 6
(+ve))',/xstyle,yrange = [-30,30],ytitle = 'Colatitude [' + deg_sign +
'] (MLT = 0 (-ve) & 12 (+ve))',ytickname = colatitudes,/ystyle,levels =
[-1.0,-0.8,-0.6,-0.4],/fill,c_col = [1,2,3,4],position =
[0.09,0.3,0.49,0.86],title = 'Current density',max_value = -0.2

polar_contour,current,mltrad,colat,levels =
[0.2,0.4,0.6,0.8],/cell_fill,c_col = [7,8,9,10],position =
[0.09,0.3,0.49,0.86],/overplot

; Plot contour lines over the colour fills to make it legible.
polar_contour,current,mltrad,colat,levels = indgen(ncontours / 2 - 1) *
```

0.2 + 0.2,/overplot
polar_contour,current,mltrad,colat,levels = indgen(ncontours / 2) * 0.2
- 1.0,/overplot

The above code does not work, in that it doesn't plot the negative part of the current density going up to a value of -0.2 as I would like it to. Actually, what it plots is this:
http://dl.dropbox.com/u/3775836/20101212.north.642.oval.wron g.pdf

If I replace that first POLAR_CONTOUR command thusly (multiply the currents by -1 and then plot using the same levels as the positive side of things but removing the max_value keyword and the colours running from 4 to 1 instead of 1 to 4):

polar_contour,-current,mltrad,colat,xrange = [-30,30],xtickname = colatitudes,xtitle = 'Colatitude [' + deg_sign + '] (MLT = 18 (-ve) & 6 (+ve))',/xstyle,yrange = [-30,30],ytitle = 'Colatitude [' + deg_sign + '] (MLT = 0 (-ve) & 12 (+ve))',ytickname = colatitudes,/ystyle,levels = [0.2,0.4,0.6,0.8],/fill,c_col = [4,3,2,1],position = [0.09,0.3,0.49,0.86],title = 'Current density'

I get this: http://dl.dropbox.com/u/3775836/20101212.north.642.oval.pdf
(which is what I would have expected both commands to eventually generate).

Why are the two behaving differently? Is this just POLAR_CONTOUR being POLAR_CONTOUR or is it me not spotting something obvious?

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