Subject: Re: weird contour lines
Posted by David Fanning on Sat, 31 Oct 2009 16:09:27 GMT
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Libo Wang writes:

> Hi, I used the following code to set up a stereographic projection map
> and overplot NCEP pressure field on it:
>
> MAP_SET,/stereographic, 60, -105,color=grey,limit=[30,-180,80.0,-10],/
> continents,/isotropic
> levels = 16
> step=4
> userLevels = IndGen(levels) * step + 120
> Contour, data,lon,lat,C_Colors=black,Levels=userLevels, /overplot
> Contour, data,lon,lat,/Overplot,
> Levels=userLevels,c_colors=black,c_charthick=2,$
> max_value=200,min_value=120,/Follow
>
> However, I got weird contour lines, which you could take a look at the
> following link:
> http://picasaweb.google.com/libowa/DropBox?feat=directlink
>
> Could you point out what was wrong in my codes? How could I get smooth
> contour lines?

Is this an aesthetic problem or a science problem?

If it is an aesthetic problem, that NCEP data is fairly low-resolution.
You could try CONGRIDing it to a larger size, using interpolation,
before contouring it. Or, you could just try smoothing your data
before you contour it.

Cheers,

David

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

Subject: Re: weird contour lines

On Oct 31, 12:09 pm, David Fanning <n...@dfanning.com> wrote:
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> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming:http://www.dfanning.com/
> Sepore ma de ni thui. ("Perhaps thou speakest truth.")- Hide quoted text -
>
> - Show quoted text -

Thanks, David. I've read helpful tips in your website. It is actually
a bit of both aesthetic problem and a science problem! A meteorologist
would probably tell me that my map is not what a standard pressure
field plot should look like!

I tried to expand my data from 144*37 to 1440*370 using cubic=-0.5 in
Congrid,the contour map did improved in some parts, but some parts got
worse:

http://picasaweb.google.com/lh/photo/pbT1Ftfbx0nqS9O3uw0tGg? feat=directlink

The NCEP data is low in resolution: 2.5 degree spacing. What else
could I try?

Subject: Re: weird contour lines
Posted by David Fanning on Sat, 31 Oct 2009 17:16:48 GMT
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Libo Wang writes:

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>
> The NCEP data is low in resolution: 2.5 degree spacing. What else
> could I try?

Well, this is a pain-in-the-kiester solution, but what you
could do is obtain each closed contour from the CONTOUR
command (PATH_XY keyword, etc.) and "resample" it with the
ArcSample program from my web page:

http://www.dfanning.com/programs/arcsample.pro

The purpose of ArcSample is to re-sample the contour
at approximately equally spaced intervals, and then to
use those points to interpolate the contour. This has
the effect of smoothing the contour. I use this, for
example, when I am getting the starting points for
an active contour or snake algorithm.

I wouldn't go to this kind of trouble unless your
meteorologist friend is EXTREMELY anal.

Cheers,

David

P.S. I assume you tried using the MIN_CURVE_SURF program
on your data and gave up because you don't have that many
hours in the day.

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

Subject: Re: weird contour lines
Posted by Libo Wang on Sun, 01 Nov 2009 03:08:13 GMT
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On Oct 31, 1:16 pm, David Fanning <n...@dfanning.com> wrote:
> Libo Wang writes:
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> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
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Thanks, David. I'll probably try the arcsample approach some day (I'm pretty sure I'll make more contours in IDL!). For this "simple" task, I'll see if I could do it in other softwares :(

I did try the MIN_CURVE_SURF fuction, but killed the run after 5 minutes.

Subject: Re: weird contour lines
Posted by Brian McNoldy on Mon, 02 Nov 2009 16:07:32 GMT
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>> Libo Wang writes:
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>
>>> The NCEP data is low in resolution: 2.5 degree spacing. What else
>>> could I try?
>

The reason the results look so choppy is because the NCEP data are at

2.5-degree resolution and are near the pole; that results in a rather irregularly spaced grid (still a regular lat/lon grid, but the longitudes converge to a singularity). Anyway, have you tried using SMOOTH on the data like David suggested a couple days ago? This might be too simple, but could actually do the job. Try a variety of widths: 3, 5, 7. Secondly, over what time period are the surface pressure data averaged? Is it a daily field, monthly? Daily fields at 2.5 degrees are generally quite choppy by nature due to poor input data in very high latitudes. Here's a link to a plot I generated on ESRL's website of January 2009 surface pressure:
http://einstein.atmos.colostate.edu/~mcnoldy/tmp/slp_jan2009 .png

Brian

==
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