
Subject: Re: 3D graphing

Posted by [David Fanning](#) on Mon, 18 Aug 2008 21:40:54 GMT

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orangelubee writes:

- > I've been trying to make a very simple 3D graph for days now and I'm
- > completely stumped because I know nothing about this. My data is
- > gridded data of temperatures at different levels of the atmosphere
- > over Antarctica and I have nice plots using map_set and contour for
- > each level separately but I would really like to have a 3D version of
- > just one temperature contour throughout the entire atmosphere. Is
- > there a way to get a z-axis added to a map and contour at each level?
- > I've tried using T3D but I'm not understanding how it applies to
- > contour and plot or really how it works at all. I've also tried to
- > use the isosurface, scale3 and then polyshade to view a certain
- > temperature surface but I keep running into this error: POLYSHADE:
- > Vertex 0: X,Y,Z location out of range. which I dont know how to fix.
- >
- > Is there an easy way to do this or am I way off track?

There is no easy way to do this. And you are probably slightly off track. :-)

Here is an article that describes how to set up a 3D coordinate system, and use it with a map. PLOT and CONTOUR can be drawn in this 3D system by setting the T3D keyword.

<http://www.dfanning.com/tips/scatter3d.html>

Direct graphics is probably the **worst** way to do this, but object graphics is even harder. **Far** harder. But is the only way to get professional looking results, I would guess.

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

Coyote's Guide to IDL Programming (www.dfanning.com)

Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: 3D graphing

Posted by [Paul Van Delst\[1\]](#) on Mon, 18 Aug 2008 21:54:16 GMT

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orangelubee wrote:

- > Hello all,
- > I've been trying to make a very simple 3D graph for days now and I'm
- > completely stumped because I know nothing about this. My data is
- > gridded data of temperatures at different levels of the atmosphere
- > over Antarctica and I have nice plots using map_set and contour for
- > each level separately but I would really like to have a 3D version of
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- > there a way to get a z-axis added to a map and contour at each level?
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- > temperature surface but I keep running into this error: POLYSHADE:
- > Vertex 0: X,Y,Z location out of range. which I dont know how to fix.
- >
- > Is there an easy way to do this or am I way off track?

I think you're heading in the right direction. I wrote a 3d-plotter many years ago to plot radiosondes ascents in 3-d (I think I may have nicked a copious amount of the code from one of David Fanning's programs). I can only offer tips towards a direct graphics solution.

Anyway, looking at the code I have, I see stuff like this:

```
; -----  
; Use SURFACE to establish the 3D transform and draw  
; the base X, Y, and Z axes.  
; The IDL documentation was very unclear on how to draw  
; axes (i.e. where to get the co-ordinate points from)  
; if T3D and SCALE3 are used. So, this method will be  
; oh-so-slow for very large n.  
; -----
```

```
SURFACE, FLTARR( n, n ), x, y, $  
    AZ = 50, $  
    /NODATA, $  
    /SAVE
```

```
; -----  
; Draw the "*" axes as shown below:
```

```
; *****  
; **      *  
; * *     *  
; O *     *
```

```

;      o *      *
;      Z o *****o
;      o *      o
;      o*      o X
;      0000000000
;      Y
;
;
;

```

```

; The axes designated with a "o" are drawn by
; the initial call to SURFACE. All others, the
; "*" axes, are drawn via the AXIS commands
; that follow.
; -----

```

```

; -- Dummy axes name
; name = REPLICATE( ' ', 30 )

```

```

; -- Draw the various axes with default ticklength and no names

```

```

; AXIS, xmax, ymin, zmin, $
;   /YAXIS, /T3D, $
;   YLOG = ylog, $
;   YTICKNAME = name, YTICKLEN = 0
; AXIS, xmax, ymin, zmin, $
;   /ZAXIS, /T3D, $
;   ZLOG = zlog, $
;   ZTICKNAME = name, ZTICKLEN = 0
; AXIS, xmin, ymax, zmin, $
;   /XAXIS, /T3D, $
;   XLOG = xlog, $
;   XTICKNAME = name, XTICKLEN = 0
; AXIS, xmin, ymax, zmax, $
;   /XAXIS, /T3D, $
;   XLOG = xlog, $
;   XTICKNAME = name, XTICKLEN = 0
; AXIS, xmax, ymax, zmin, $
;   /ZAXIS, /T3D, $
;   ZLOG = zlog, $
;   ZTICKNAME = name, ZTICKLEN = 0
; AXIS, xmax, ymin, zmax, $
;   /YAXIS, /T3D, $
;   YLOG = ylog, $
;   YTICKNAME = name, YTICKLEN = 0

```

```

; -----
; Enable use of the 3D transform
; -----

```

```

!P.T3D = 1

```

```

; -----
; Plot the actual data
; -----

PLOTS, x, y, z, /T3D

; -----
; Plot the projections
; -----

; XY projection
IF ( xyproject EQ 1 ) THEN $
  PLOTS, x, y, FLTARR( n ) + zmin, $
    /T3D, $
    THICK = thick, COLOR = project_color, LINESYLE = linestyle

.etc....

; -----
; Turn off 3D transformations
; -----

!P.T3D = 0

```

I think the important thing is how you establish the 3D transform. I used an "empty" surface plot. Getting the contour plot on there as well is not something I know how to do off the top of my head, but I think there may be a how-to on that in the IDL docs.

Or on David's website (I would check that first). Struan Grey (Gray?) used to have a website dedicated to all these sorts of shenanigans. Maybe it's still out there?

Good luck.

cheers,

paulv

Subject: Re: 3D graphing
 Posted by [orangelubee](#) on Tue, 19 Aug 2008 17:48:12 GMT
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Thanks for the help. I hope this doesn't show how computer illiterate I am (I'm a novice IDLer) but I don't know what the difference between

direct graphics and object graphics. Or what I'm attempting to do in relation to this, I guess.

I'm going to try both ideas and see how it goes.

Thanks again,
Stephanie
