Subject: Contour plots on irregular ranges
Posted by galambos on Thu, 25 Feb 1993 17:04:25 GMT
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I'm considering getting PV-Wave, but am concerned whether it can
do contour plots over irregular ranges of data (i.e. z values for
non-square sets of x-y points). I've only got access to a demo version
with summary "manuals" - and the only contour examples I've seen are
over nice square/rectangular (x,y) ranges.

Thanks, John Galambos (email - galambos@ornl.gov)

Subject: Re: Contour plots on irregular ranges
Posted by sterne on Mon, 01 Mar 1993 03:46:37 GMT
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In article <galambos.730659865@moonshine> galambos@moonshine.llnl.gov (John Galambos - OR - Iter) writes:

> I'm considering getting PV-Wave, but am concerned whether it can
> do contour plots over irregular ranges of data (i.e. z values for
> non-square sets of x-y points). I've only got access to a demo version
> with summary "manuals" - and the only contour examples I've seen are
> over nice square/rectangular (x,y) ranges.

Wave/IDL can deal with nice square/rectangular, but can also deal with some irregular grids as well. When you call contour, you can call it with X and Y as vectors, which will generate a rectangular grid, or with either X or Y (or both) as arrays, where each element will specify the appropriate X (Y) component for the corresponding Z array index.

If the grid is truly random, wave has a problem deciding where the boundary is and which points should be connected to which; the resulting contours look like a jumble of intersecting lines. However, if you can think of your grid as some sort of distorted rectangular grid, it does a fine job of contouring the data. For example, if you can view your grid as a stretched or distorted rectangular grid, it will work well. If your grid is more random than this, you may well have problems.

Example: Contour r^2 within an arc of a circle, 1<r<10, 0<theta<60

```
r = findgen(10) + 1.0              ;  radius
theta = findgen(7)*10.0*!pi/180.0   ;  angle in radians
x = r#cos(theta)                   ;  x array
y = r#sin(theta)                   ;  y array
z = x^2 + y^2                      ;  function to plot
```

contour,z,x,y

Clearly this is not a simple square/rectangular array, but it is not
random either. Contrast this with what you get by trying the following:

```
x = randomu(seed,5,5)
y = randomu(seed,5,5)
z = randomu(seed,5,5)
contour z,x,y
```

which looks like a one-year-old scribbled on the screen.

So Wave/IDL can contour irregular grids, but best results are obtained
when the (x,y) points are still relatively well ordered, and not
randomly arranged.

Phil
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