
Subject: Images with coordinate axes, log scale etc.
Posted by [pgrigis](#) on Mon, 25 Feb 2008 23:58:08 GMT
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Hi folks,

there seems to be a recurrent theme in this newsgroup of questions about how to plot images with plot axes (be it linear or log scale) and/or irregularly gridded images.

For example, people may have this image

```
im=dist(128,128)
```

and two coordinates vectors

```
x=findgen(128)+1  
y=findgen(128)+1
```

and may want to plot the image with the axes overlaid on it, in linear or log scale.

There are some way to accomplish this in direct graphics:

- a) use a routine like "spectro_plot" or "plot_image" from various sources
- b) use contour (strange as it may seem,
contour,im,x,y,levels=findgen(256)/255*max(im),/fill,/xstyle ,/ystyle
does the job, although it is slow and introduces some kind of (possibly unwanted) smoothing. If you don't believe this can be used as a first approximation, try it on the "rose.jpg" image for the IDL examples. Works quite well (for a one liner).
- c) do it from scratch

Now, a) requires a library that people may not have or want, and b) is not really an option for serious work because of artifacts from the contouring algorithm, so I decided it was time to write a short stand-alone program for plotting images with axes. I took the main ideas from SSW's "spectro_plot", which in turn stole it from the Wind software package, I think.

The routine can be found at

http://hea-www.harvard.edu/~pgrigis/idl_stuff/pg_plotimage.p ro
and can be used pretty much as one would use "plot", only with the additional required inputs of the x and y vectors with the coordinates.

Here's an example (using the above definitions)

```
loadct,5
pg_plotimage,im,x,y,/xlog,/xstyle,/ystyle,yrange=[-10,200]$
,title='distorted dist() image'
```

or, if one likes some smoothing

```
pg_plotimage,im,x,y,/xlog,/xstyle,/ystyle,yrange=[-10,200],/ smooth $
,title='smoothed',xtitle='some units',position=[0.2,0.2,0.8,0.8]
```

Using the "rose" image example:

```
rose = READ_IMAGE(FILEPATH('rose.jpg', $
SUBDIRECTORY=['examples','data']))
dim = SIZE(rose,/DIM)
nx = dim[1] & ny = dim[2]
x = findgen(nx)+1
y = findgen(ny)+1
im=bytsc1(total(rose,1))
loadct,0
```

```
pg_plotimage,im,x,y,/xstyle,/ystyle,/smooth,/ylog $
,title='Gray Rose',xtitle='some units',position=[0.2,0.2,0.8,0.8]
```

Maybe this can be of some use. I haven't really tested heavily, so let me know if you find bugs or have suggestion for improvement. Just be aware that if you have negative or 0 axis values and try the log keywords, you are beyond redemption ;-)

How does the routine work? The idea is to interpolate the input image at the location of every pixel in the plot window (the coordinates associated with each pixel depend then on the plot & window size and the linear vs. log axis choice). This is reasonably fast, as interpolation of, say, about 1 million data points is not a hard thing to do.

Cheers,
Paolo
