

Using IDL to produce publish-quality plots

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 - Data- or object-oriented languages (FORTRAN, C++) -> not so interactive

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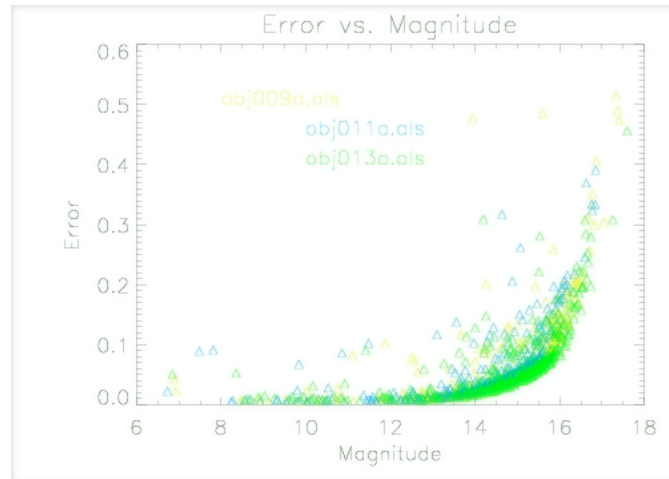
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- IDL is expensive -> **Alternatives**:
 - a free, open-source version has been released: GDL
 - GDL is compatible with the mostly used IDL instructions
 - Otherwise you can always run the demo version of IDL : 7 minutes
 - PYTHON is open-source, free, more flexible and powerful than IDL

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- IDL vs. PYTHON: same as Fortran vs. C++
 - IDL still widely used in astronomy so:
 - many numerical and astronomical mature libraries available
 - wide astronomical user base

Using IDL to produce publish-quality plots

- We think horrid plots are an old relic from the past, everyone is careful
- NO! We still see *too often* plots like



- It shouldn't be YOU!



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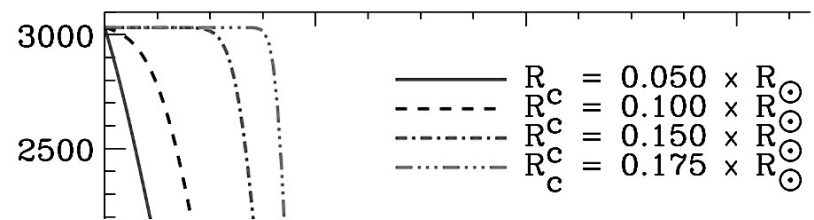
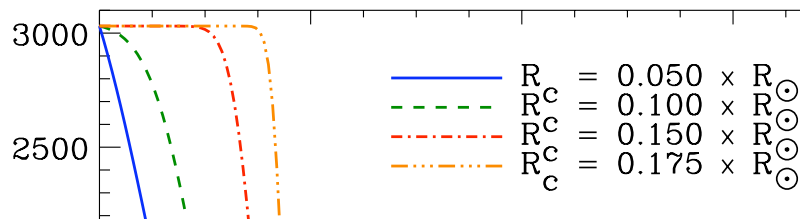
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Using IDL to produce publish-quality plots

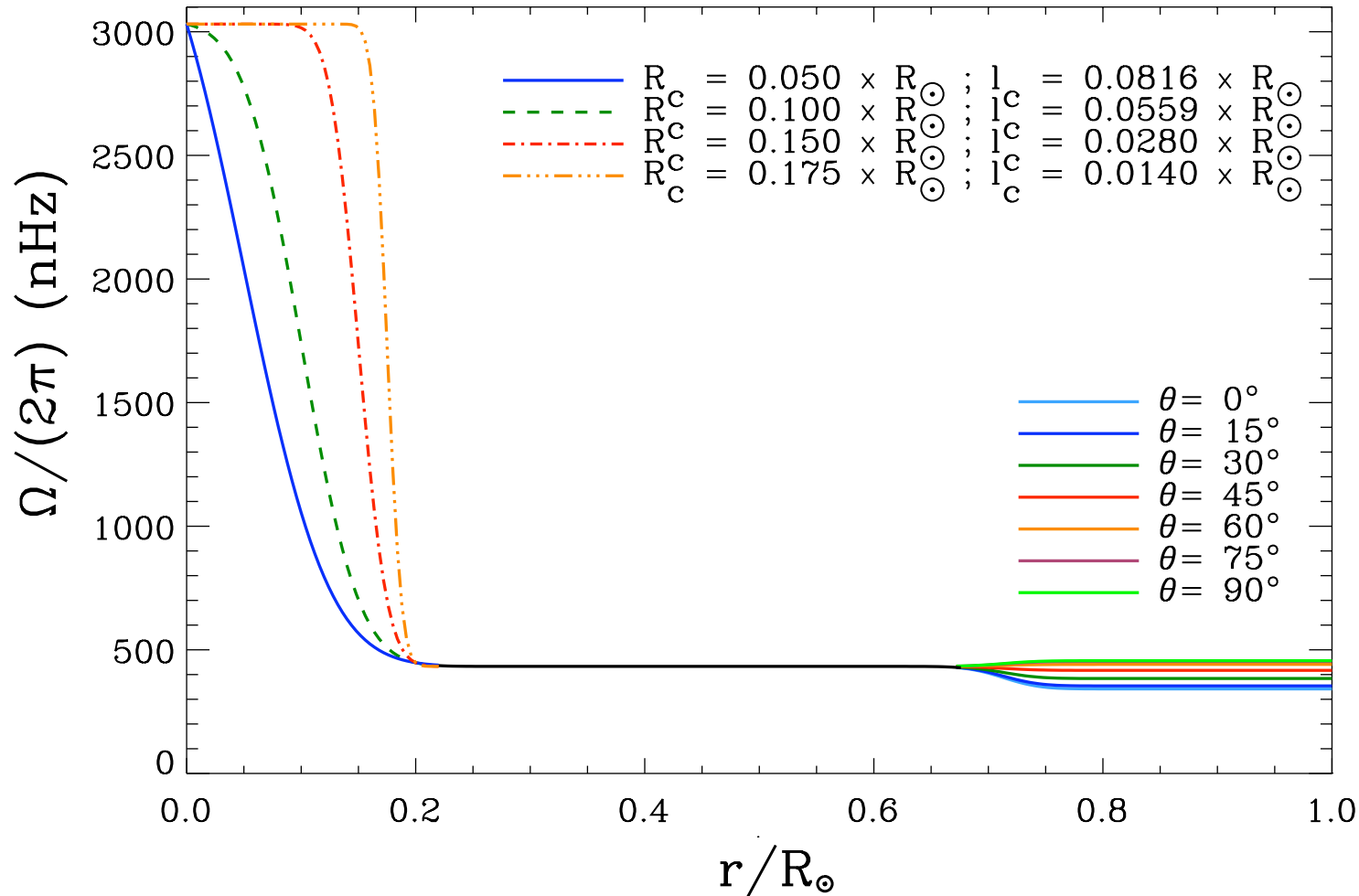
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» good both for color and B&W prints:



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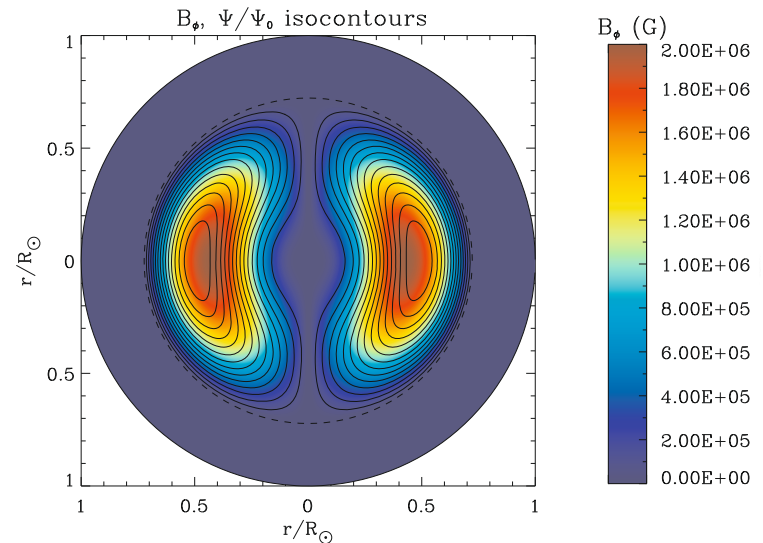
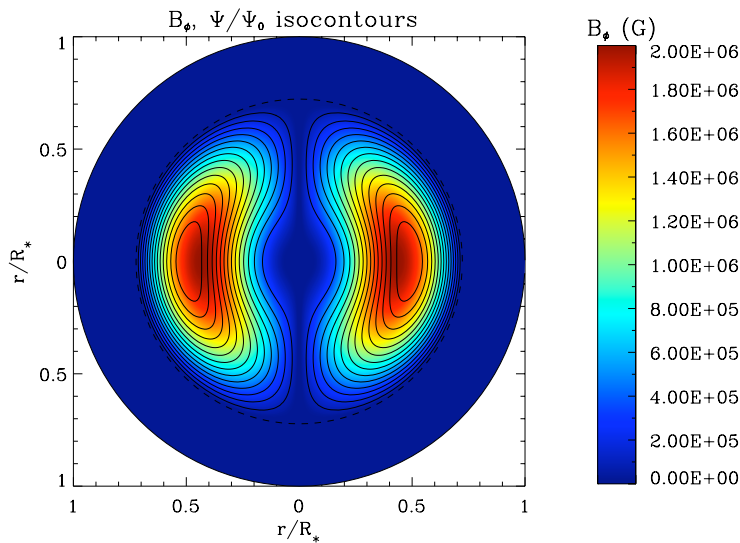
- a readable plot example



Using IDL to produce publish-quality plots

Be careful with RGB vs. CMYK printed plots

- RGB plot created as it appears on screen
- RGB plot created with the CMYK keyword as it appears on paper
- RGB plot converted into CMYK by the editor



Using IDL to produce publish-quality plots

- Session launch basics ... In a *X-terminal* :

```
>idl <RETURN>
```

```
IDL> a=...
```

a= 1.0e-8 creates a floating point scalar

a = 3.0d10 creates a double-precision floating point scalar

a = [1,2,3] & a = [a,4,5] creates and then expands an integer vector

```
IDL> help, a displays 'a' properties
```

```
IDL> print, a displays 'a' value
```

```
IDL> a=findgen(3) similar to a=[1,2,3] where a[0]=1, a[1]=2 and a[2]=3
```

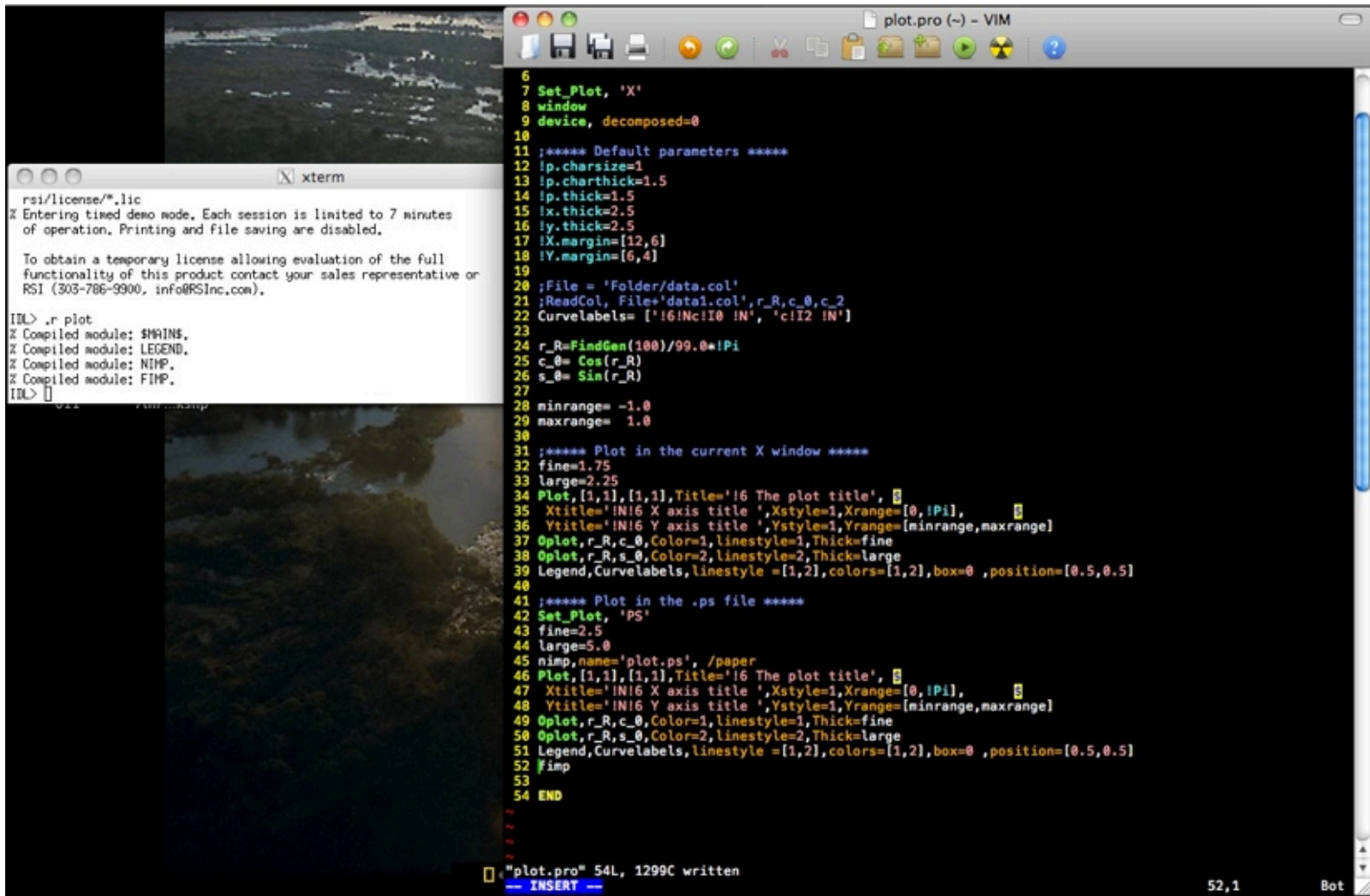
```
IDL> a=findgen(50) & f= Sin(a)
```

```
IDL> plot, f
```

```
IDL> exit
```

Using IDL to produce publish-quality plots

- Write and compile a program e.g. 'plot.pro', using your preferred editor (vim):



```
6
7 Set_Plot, 'X'
8 window
9 device, decomposed=0
10
11 ;**** Default parameters ****
12 lp.charsize=1
13 lp.charthick=1.5
14 lp.thick=1.5
15 !x.thick=2.5
16 !y.thick=2.5
17 !X.margin=[12,6]
18 !Y.margin=[6,4]
19
20 ;File = 'Folder/data.col'
21 ;ReadCol, File+'data1.col', r_R, c_0, c_2
22 Curvelabels= ['!G!Nc!I0 !N', 'c!I2 !N']
23
24 r_R=FindGen(100)/99.0*!Pi
25 c_0= Cos(r_R)
26 s_0= Sin(r_R)
27
28 minrange= -1.0
29 maxrange= 1.0
30
31 ;**** Plot in the current X window ****
32 fine=1.75
33 large=2.25
34 Plot, [1,1], [1,1], Title='!6 The plot title',
35 Xtitle='!N!6 X axis title ', Xstyle=1, Xrange=[0,!Pi],
36 Ytitle='!N!6 Y axis title ', Ystyle=1, Yrange=[minrange,maxrange]
37 Oplot, r_R, c_0, Color=1, linestyle=1, Thick=fine
38 Oplot, r_R, s_0, Color=2, linestyle=2, Thick=large
39 Legend, Curvelabels, linestyle = [1,2], colors=[1,2], box=0 , position=[0.5,0.5]
40
41 ;**** Plot in the .ps file ****
42 Set_Plot, 'PS'
43 fine=2.5
44 large=5.0
45 nimp, name='plot.ps', /paper
46 Plot, [1,1], [1,1], Title='!6 The plot title',
47 Xtitle='!N!6 X axis title ', Xstyle=1, Xrange=[0,!Pi],
48 Ytitle='!N!6 Y axis title ', Ystyle=1, Yrange=[minrange,maxrange]
49 Oplot, r_R, c_0, Color=1, linestyle=1, Thick=fine
50 Oplot, r_R, s_0, Color=2, linestyle=2, Thick=large
51 Legend, Curvelabels, linestyle = [1,2], colors=[1,2], box=0 , position=[0.5,0.5]
52 fimp
53
54 END
```

rsi/license/*.lic
X Entering timed demo mode. Each session is limited to 7 minutes of operation. Printing and File saving are disabled.

To obtain a temporary license allowing evaluation of the full functionality of this product contact your sales representative or RSI (303-786-9900, info@RSInc.com).

IDL> .r plot
X Compiled module: \$MATHS.
X Compiled module: LEGEND.
X Compiled module: NIMP.
X Compiled module: FIMP.
IDL>

plot.pro 54L, 1299C written
-- INSERT --

52,1 Bot

Using IDL to produce publish-quality plots

- Remember:

IDL> plot_IO -> Log plot

IDL> oplot -> overplot

- Additional files:

nimp.pro & fimp.pro -> open & close a PS file. Useful option : paper
legend.pro -> draws a legend
colors.pro -> provides nice colors for the lines (good on hte
 screen and printed)
colorbar.pro -> to draw a colorbar e.g. besides a contour plot

- Some tutorial links

http://www.stsci.edu/hst/training/events/IDLTopics/SSD98IDL/IDL_plotting2.html

<http://www.astro.virginia.edu/class/oconnell/astr511/IDLguide.html>