

Analysis Methods in Atmospheric and Oceanic Science

AOSC 652

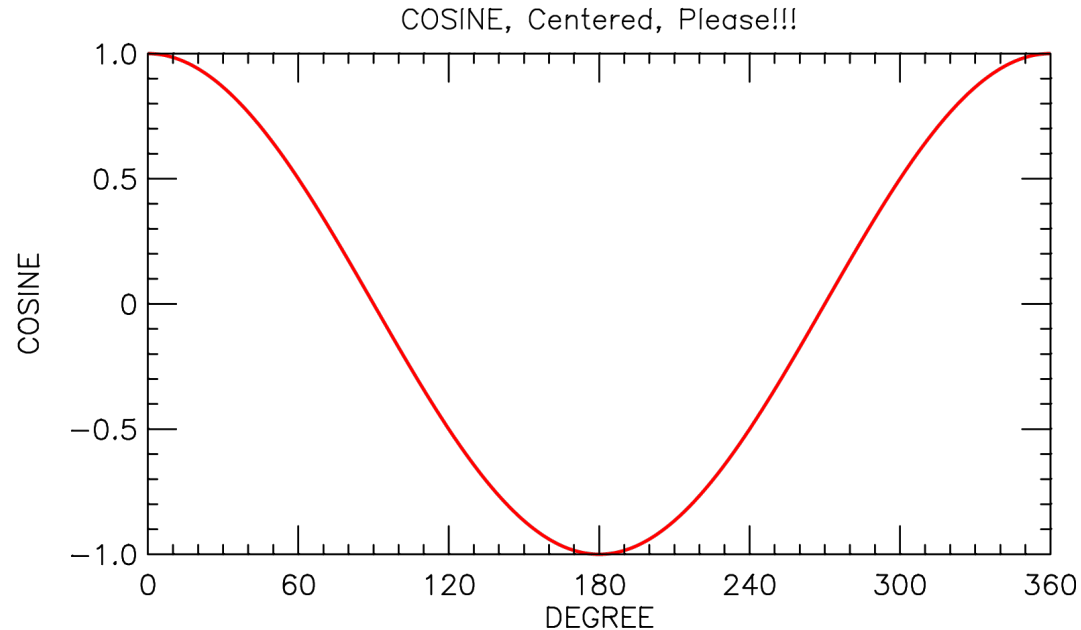
Introduction to Graphics and Analysis of Satellite
Measurements of Atmospheric Composition: Day 2

14 Sep 2016

AOSC 652: Analysis Methods in AOSC

Hopefully everyone has been able to produce a plot of the cosine curve:

Hope this works!



160912
/homes/metofac/rjs/aosc652/week_02/stncl.200

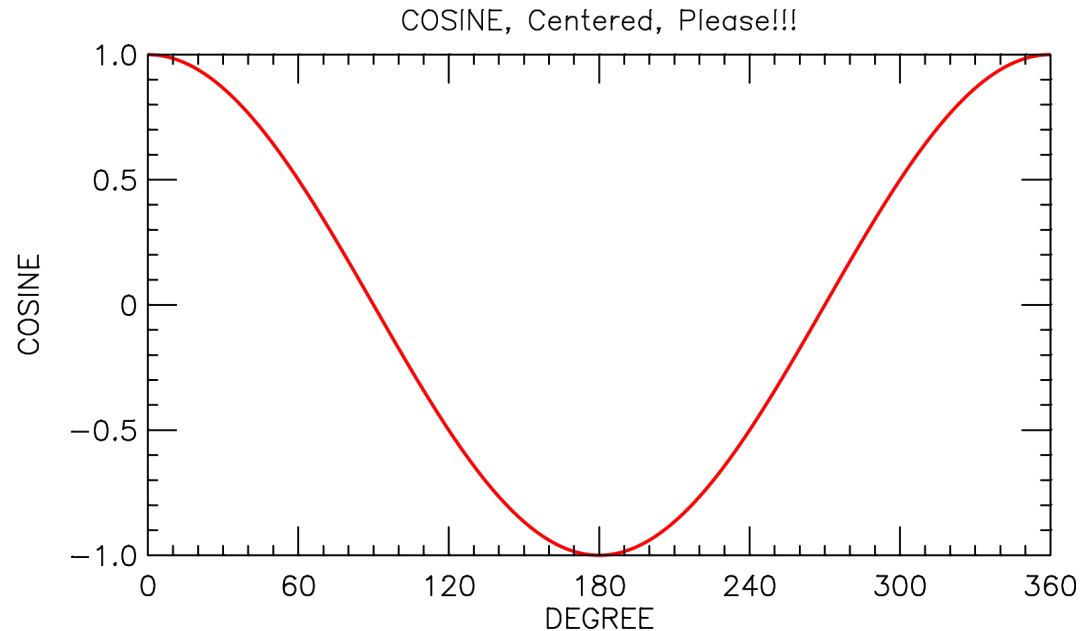
I convert EPS to PNG using the Linux “convert” command:

```
metosrv8.umd.edu{rjs} convert -density 200 tmp200.eps tmp200.png
```

followed by the transfer of file tmp200.png to my laptop, using the SSH Secure File Transfer Client

Let's plot cosine(degree) versus degree

Hope this works!

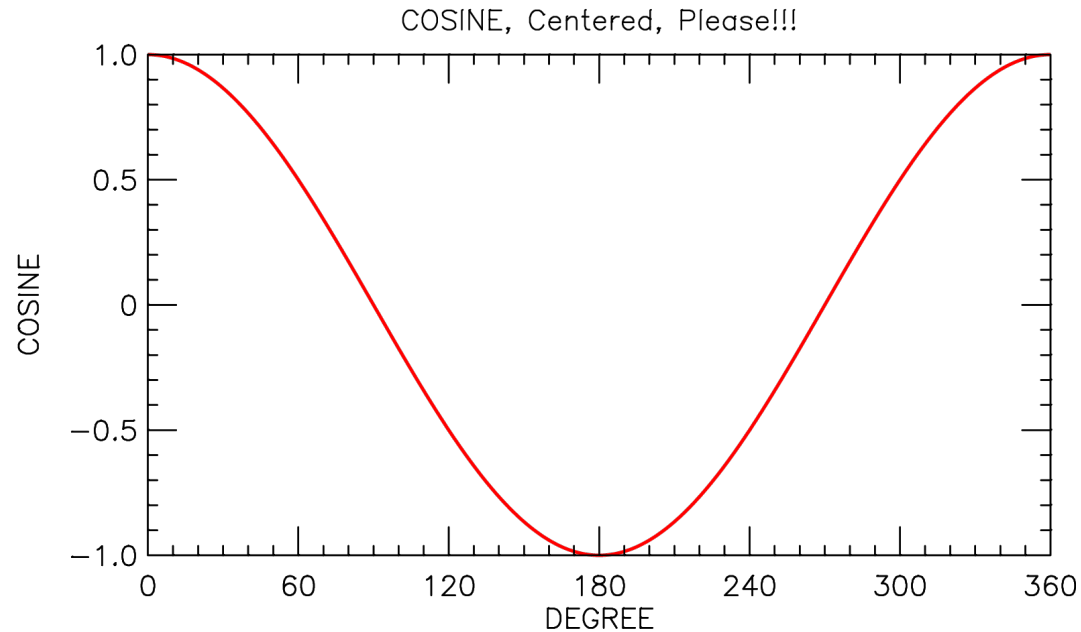


160912
/homes/metofac/rjs/aosc652/week_02/stncl.200

The file create date and pathname of the stncl.* file can be placed into the EPS & PS files or this info can be omitted

Let's plot cosine(degree) versus degree

Hope this works!

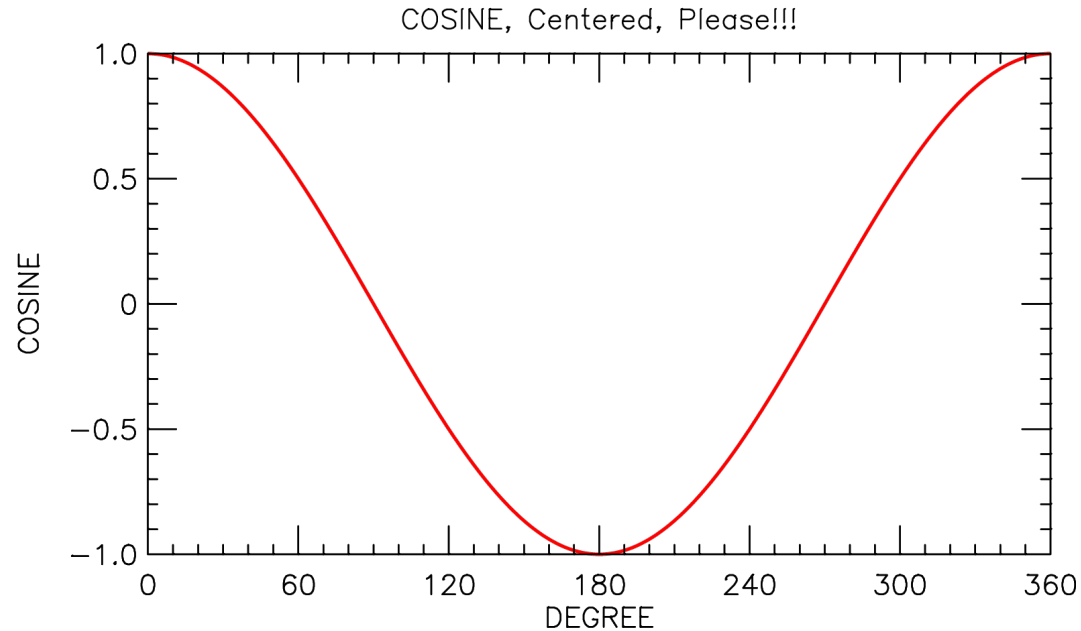


160912
/homes/metofac/rjs/aosc652/week_02/stncl.200

If sending a PS (postscript without bounding box) or EPS (encapsulated postscript, with bounding box) to a journal for publication, would of course omit this info.

Let's plot cosine(degree) versus degree

Hope this works!

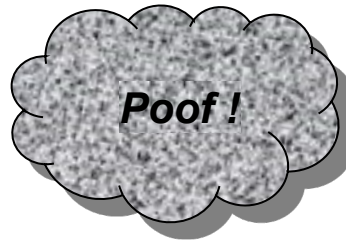
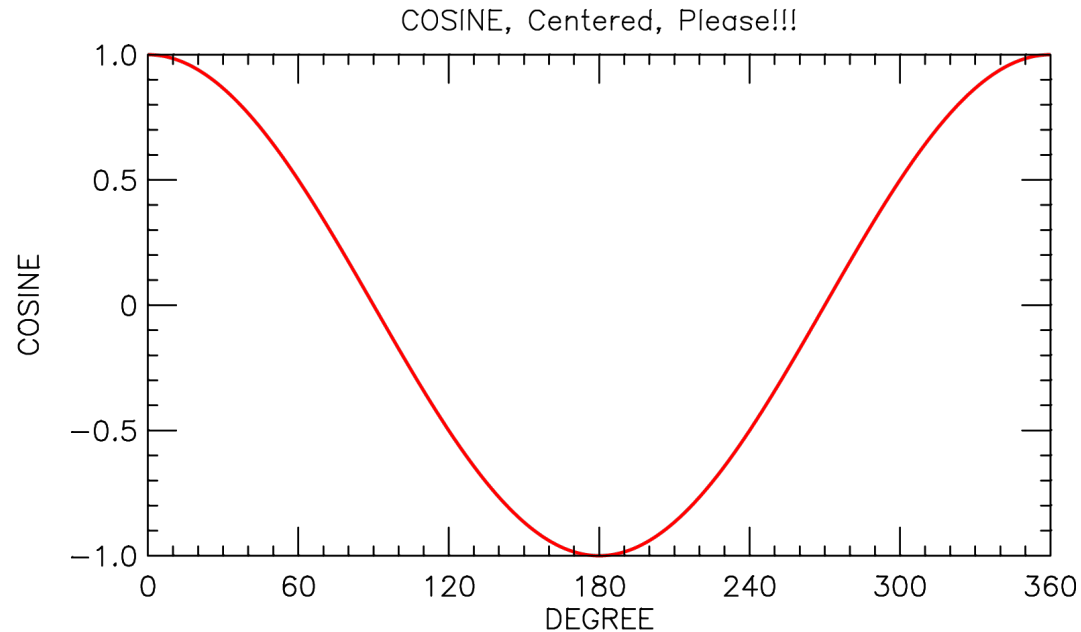


160912
/homes/metofac/rjs/aosc652/week_02/stncl.200

Can retain info in the file and not display within PowerPoint, by cropping the image from the bottom

Let's plot cosine(degree) versus degree

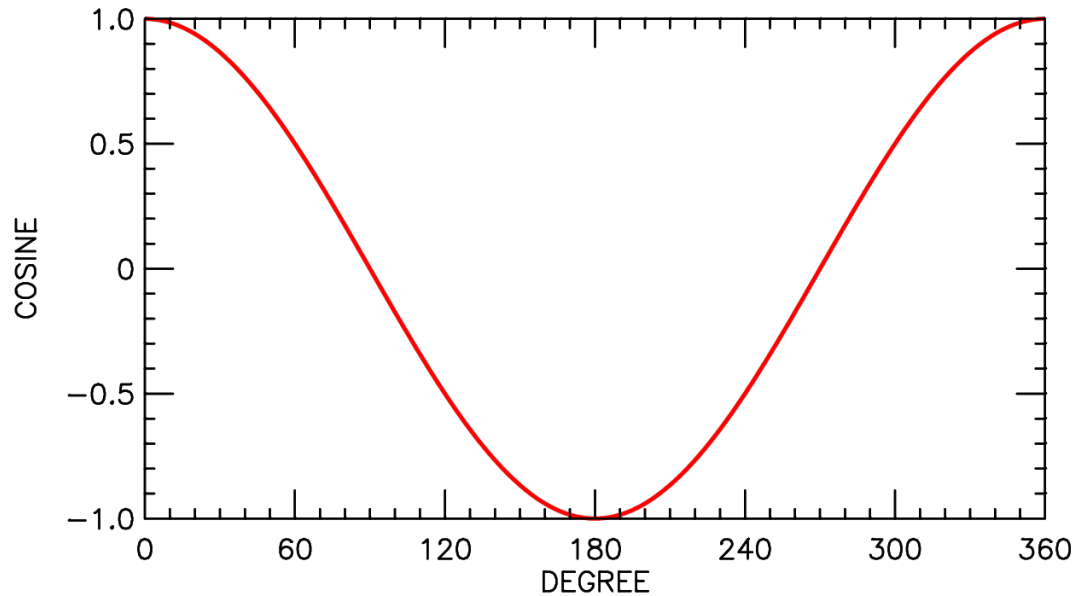
Hope this works!



Let's plot cosine(degree) versus degree

Hope this works!

COSINE, Centered, Please!!!



Output of program trig4.f: cos vs degree
File : trig4.dat

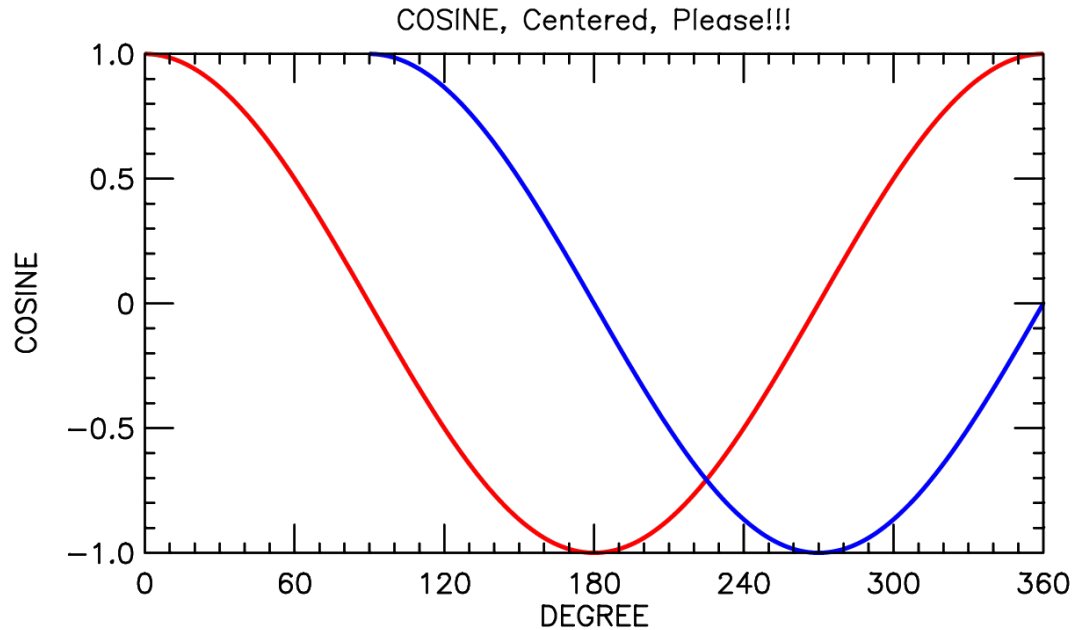
This info may be useful to record

160913
/homes/metofac/rjs/aosc652/week_02/stncl.201

Produced using stncl.201, rather than stncl. 200

Let's plot cosine(degree) versus degree

Hope this works!



Output of program trig4.f: cos vs degree
File : trig4.dat

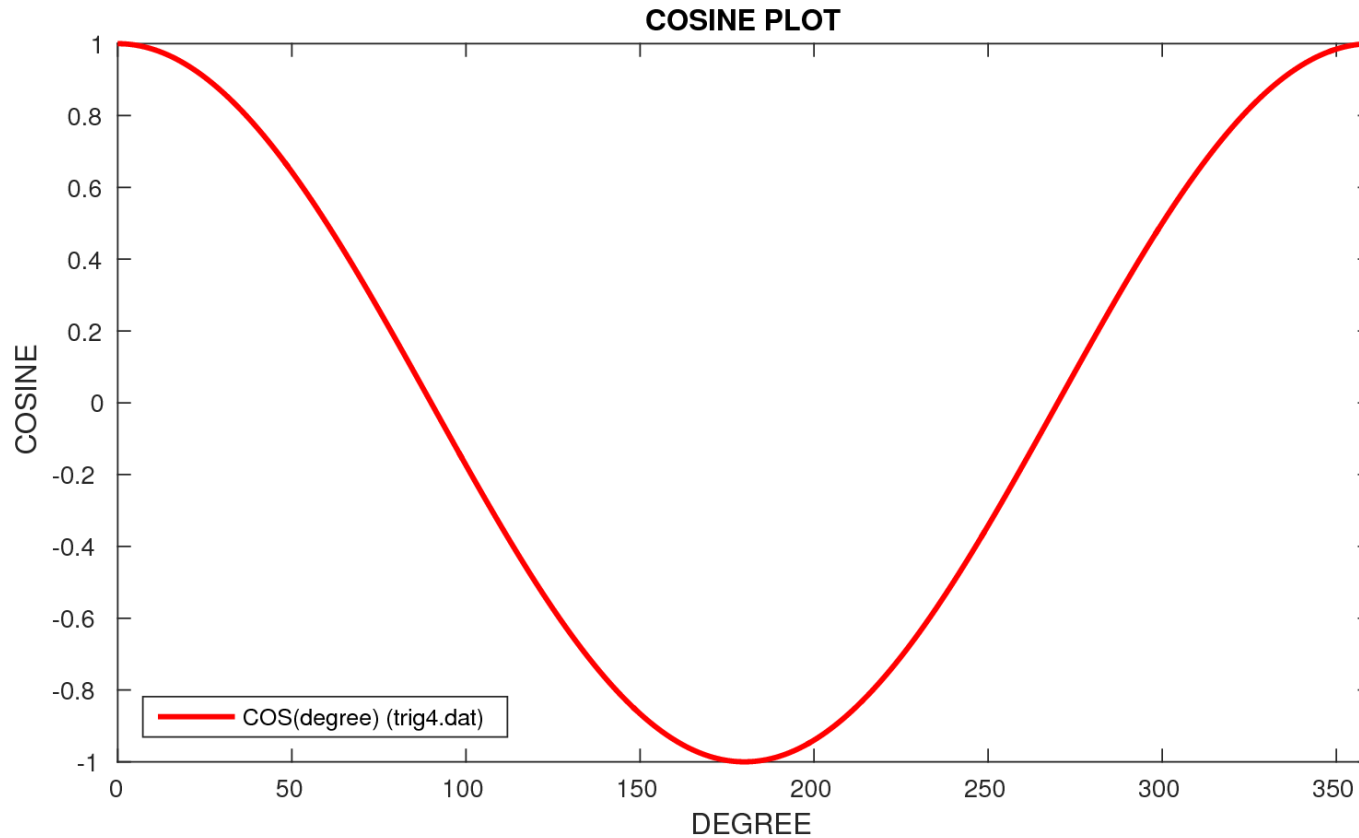
Output of program trig4.f: cos vs degree+(90.)
File : trig4.dat

This info may be
useful to record

160913
/homes/metofac/rjs/aosc652/week_02/stncl.202

Produced using stncl.202, rather than stncl. 200

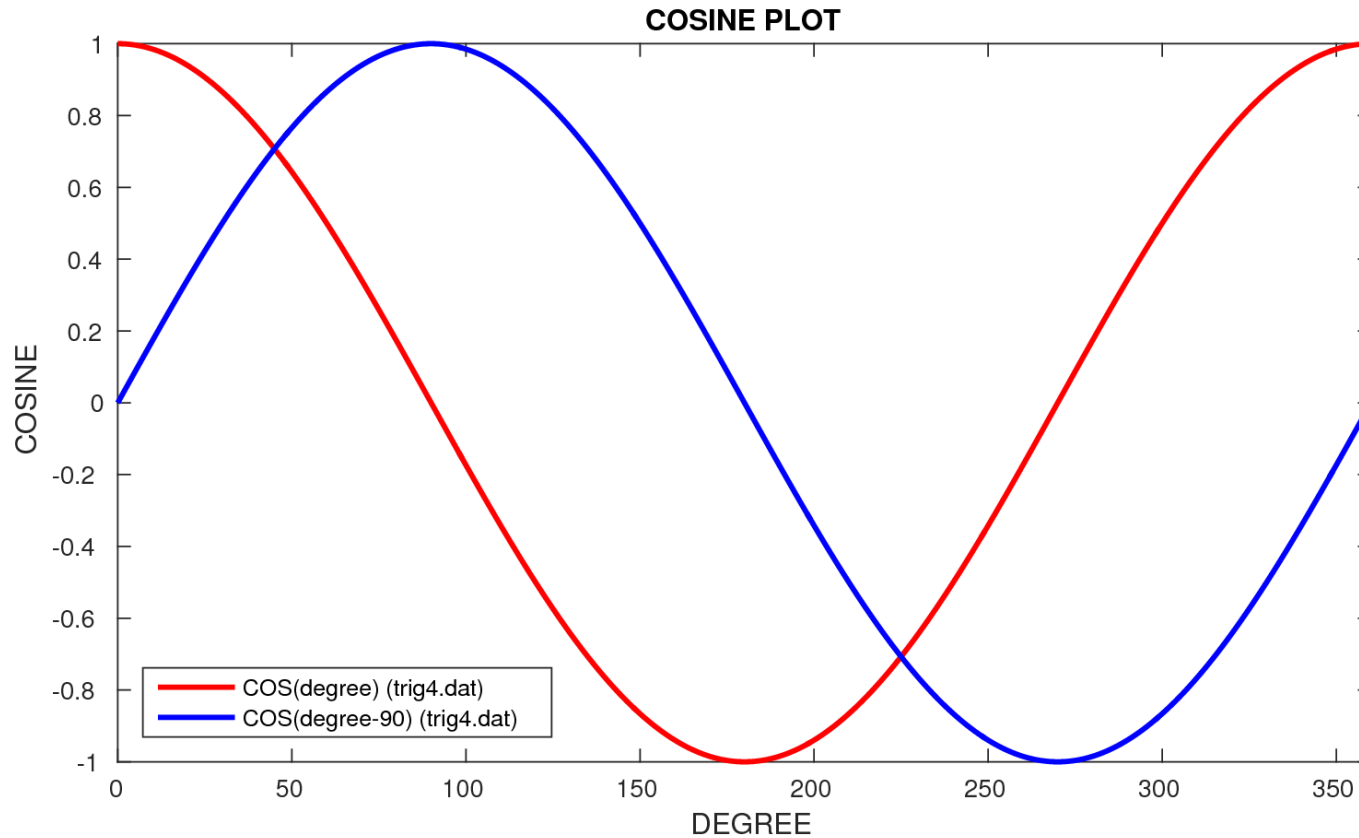
Let's plot cosine(degree) versus degree



14-Sep-2016

/homes/metogra/wtribett/aosc652/2016/Week_03/matlab_load_header_guide2.m

Let's plot cosine(degree) versus degree



14-Sep-2016

/homes/metogra/wtribett/aosc652/2016/Week_03/matlab_load_header_guide2.m

Let's Get Real Data !

Transferring L3*txt data files of NASA Aura OMI measurements of ozone using anonymous ftp (File Transfer Protocol)

```
ftp jwocky.gsfc.nasa.gov (anonymous; email_address)
cd pub
cd omi
cd data
ls
get 1README.txt

cd ozone
cd Y2016
ls
```

Then:

```
prompt
```

```
mget L3*201603*.txt (to "get" data for March 2016)
```

```
quit to end ftp session
```

AOSC 652: Analysis Methods in AOSC

Between now and Wednesday:

1. Copy L3*OMI*201603*.txt files from `~rjs/aosc652/week_03` to your work area or obtain these files using ftp from jwocky
2. Edit `omi_ozone_interpolate_orig.f` to read L3* files from your directory:
Locate the text: `/homes/metofac/rjs/aosc652/week_03/` in the code
and change to the path where you have placed the L3* files
3. Attempt to understand why this program is producing a run-time error !

Please work independently on this exercise ...
if you have any questions, please direct them to Ross, Jeff, or Walt

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PGFIO-F-231/formatted read/unit=2/error on data conversion.
File name = /homes/...
....., at line number 48

AOSC 652: Analysis Methods in AOSC

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PGFIO-F-231/formatted read/unit=2/error on data conversion.
File name = /homes/...

....., at line number 48

Why did we get this error?

AOSC 652: Analysis Methods in AOSC

Let's first take a look at file L3_ozone_omi_20160301.txt:

What does all of that gibberish mean?

AOSC 652: Analysis Methods in AOSC

Let's first take a look at file L3_ozone_omi_20160301.txt:

What does all of that gibberish mean?

What is another way you could have figured this out
(even if you are not yet a **FORTRAN** guru)?

AOSC 652: Analysis Methods in AOSC

Hopefully everyone has been able to:

a) ftp a month's worth of OMI ozone data to your work area

b) copy FORTRAN code noted below to your directory (**Mon**):

~rjs/aosc652/week_03/omi_ozone_interpolate_orig.f

c) edit the code to read files from your directory (**between Mon & Wed**):

Locate text: /homes/metofac/rjs/aosc652/week_03/

and change to the path where your OMI files are located

d) compile the code and get an error that reads (**start of class Wed**)

PGFIO-F-231/formatted read/unit=2/error on data conversion.

File name = /homes/...

....., at line number 48

**e) please copy file omi_ozone_interpolate_orig.f to
 omi_ozone_interpolate.f**

AOSC 652: Analysis Methods in AOSC

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a) ftp a month's worth of OMI ozone data to your work area

b) copy FORTRAN code noted below to your directory (**Mon**):

~rjs/aosc652/week_03/omi_ozone_interpolate_orig.f

c) edit the code to read files from your directory (**between Mon & Wed**):

Locate text: /homes/metofac/rjs/aosc652/week_03/

and change to the path where your OMI files are located

d) compile the code and get an error that reads (**start of class Wed**)

PGFIO-F-231/formatted read/unit=2/error on data conversion.

File name = /homes/...

....., at line number 48

**e) please copy file omi_ozone_interpolate_orig.f to
 omi_ozone_interpolate.f**

f) we are now going to edit file omi_ozone_interpolate.f

Standard File Format

First record: two integers \Rightarrow Ncolumns, Nheader lines

Second record: Brief mnemonic describing contents of each column, delimited by a comma

Next record(s): first header line (must have at least one header line!)

Data: numerical values delimited by either a space, multiple spaces, or a tab

Ncolumn values per record (line)

A numerical value of -999 (i.e., $-9.99E+02$, or -999.00 , or -999) denotes missing data

To complete assignment #3, you must prepare a file that looks like:

3,5

Day of Month, Date, Total Ozone Column (DU)

Bilinear Interpolation of OMI Ozone for Latitude=51.75N and Longitude=0.25E

Location is London, England

From program omi_ozone_interpolate.f

1 160301 264.25

2 160302 314.81

3 160303 369.44

etc.

Standard File Format

First record: two integers \Rightarrow Ncolumns, Nheader lines

Second record: Brief mnemonic describing contents of each column, delimited by a comma

Next record(s): first header line (must have at least one header line!)

Data: numerical values delimited by either a space, multiple spaces, or a tab

For the location, pick a latitude & longitude of your choosing but please: use a lat / lon that are not on the grid of the OMI data do not use by values of lat / lon (London) in class example

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3 160303 369.44

etc.

Standard File Format

You can prepare this file by running code `omi_ozone_interpolate.e` numerous times (once per day) and entering results into a data file.

You may want to consider making changes to `omi_ozone_interpolate.f` to make the task easier (i.e., automate cycling through the dates)

Please consult FORTRAN codes:

`~rjs/aosc652/week_03/char_loop1.f`
and `~rjs/aosc652/week_03/char_loop2.f`

for sample code that might be of use for automating the process.

Would be helpful for timely completion of assignment #3 if by start of class Friday, your data file is complete.

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3,5

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etc.

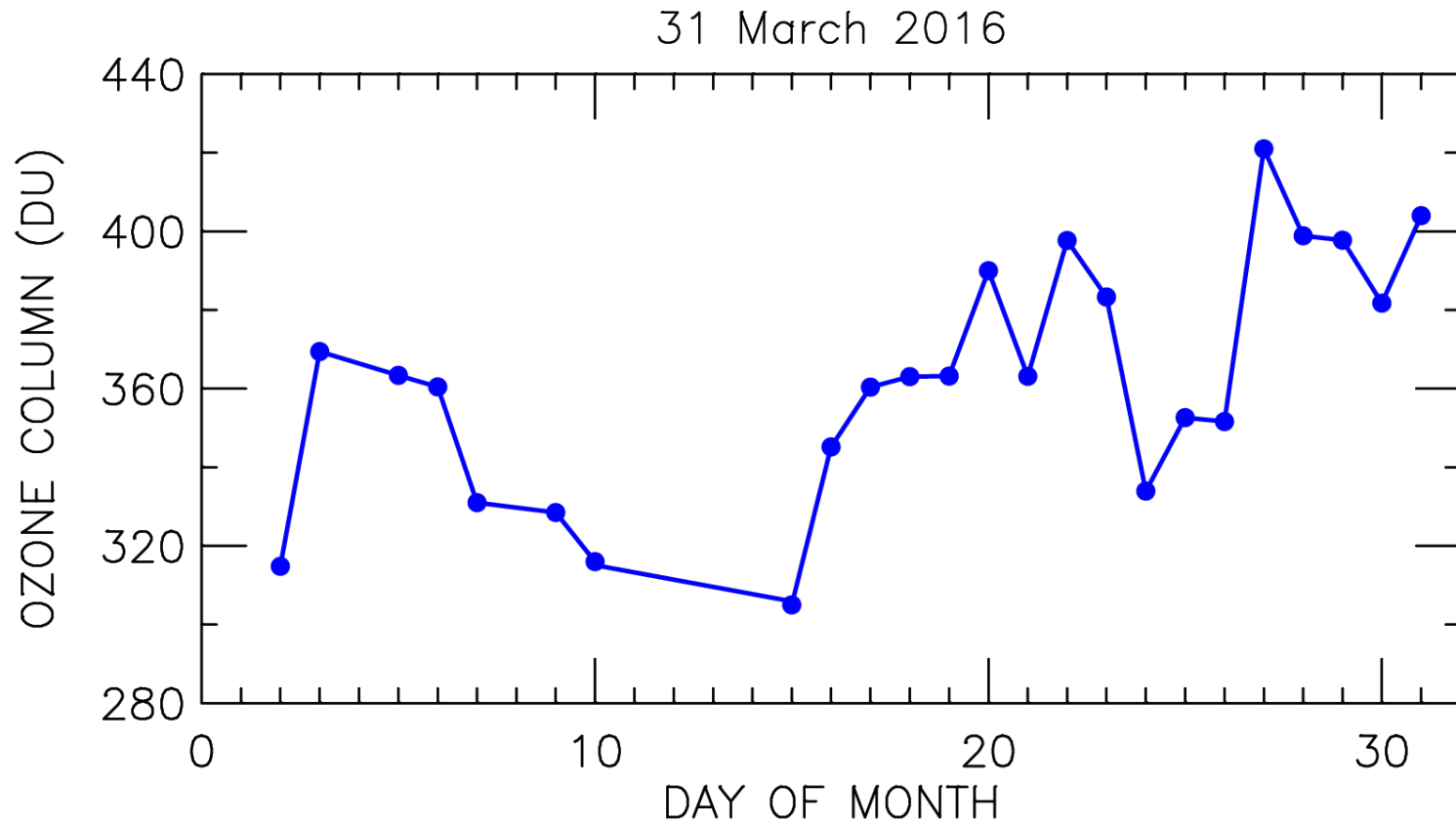
Creating a Plot

To create a new plot:

hppltd

Creates following files: stncl.* : record of your keystrokes
*.hpgl : “plot” in HP-GL syntax (ASCII file)

Creating a Plot



160913
/homes/metofac/rjs/aosc652/week_03/stncl.331

Creating a Plot

To create a new plot:

hppltd

Creates following files: `stncl.*` : record of your keystrokes
`*.hpgl` : “plot” in HP-GL syntax (ASCII file)

To produce *.ps and *.eps files of plot:

hp 131 (to execute hppltd using file `stncl.131` as input)

Note: *.ps & *.eps (encapsulated postscript) modern file type, also ASCII, to be edited only by true computer wizards.

See <http://en.wikipedia.org/wiki/HPGL>
http://en.wikipedia.org/wiki/Encapsulated_PostScript
<http://en.wikipedia.org/wiki/PostScript> for more info

To view *.eps files in linux, enter `gv filename.eps`

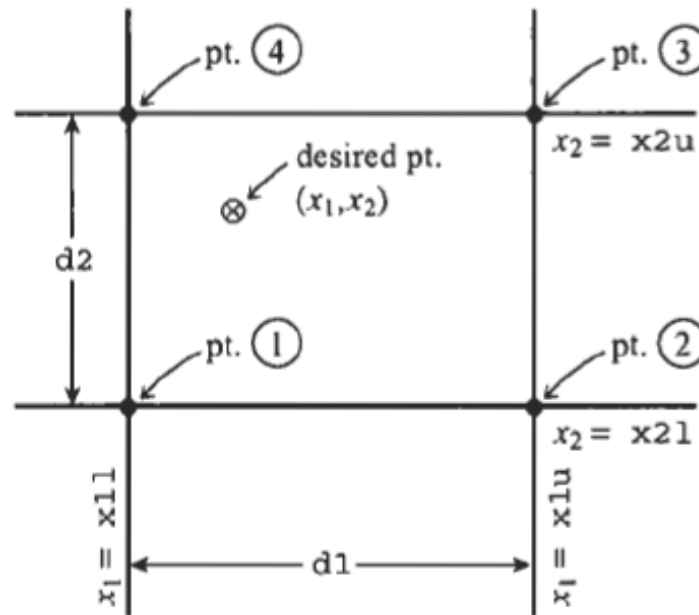
`gv` ⇒ `ghostview`

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Bilinear Interpolation

For HW #3, [you will also need](#) to “complete” subroutine bilinear: that is, write appropriate code to replace line `y_out=-999`.

This subroutine finds total ozone at the specified location (desired pt. below) given input values at pts. 1, 2, 3, and 4:



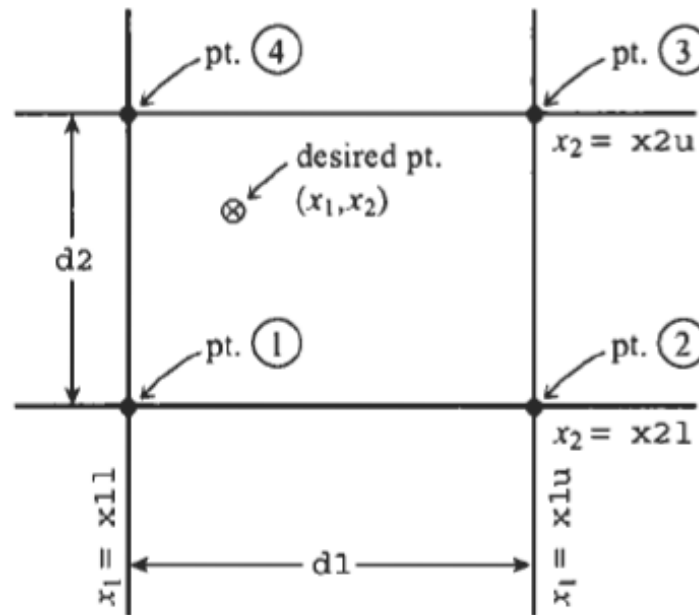
Please consult Press et al. reading for this week for guidance!

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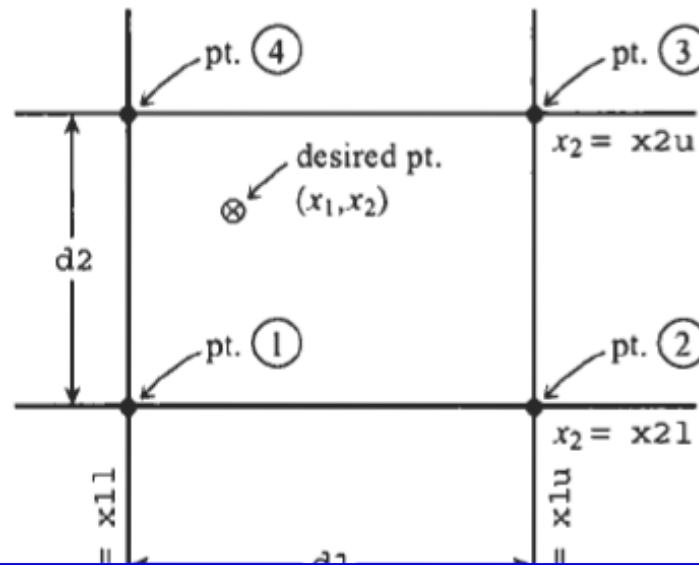
Hopefully you will have your ozone time series file for HW #3 prepared prior to the start of class on Friday.

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On Friday, Ross will review prior assignment, then provide more guidance with plotting and use of linux Open Office Impress. If anyone would like a “jump start” on completion of the assignment, please arrange to see Ross prior to class on Friday for assistance w/ plotting and/or Open Office Impress.