ATOC/ASTR 5560   Computational Laboratory

Lab Time: Friday   2:00-4:00 Fall 2001   Stadium 136

There will be a computational laboratory on Fridays in the ATOC Weather Laboratory in the Stadium. These periods will be for learning radiative transfer modeling techniques and improving your understanding of atmospheric radiative processes. We will be making small modifications in and running models written in Fortran or IDL. We will use IDL to graph the results of calculations. The PC computers in the lab will be used to access my Unix server nit.colorado.edu. The PC lab computers have been configured to run redhat linux, a variant of Unix. This way we can use X Windows to display the IDL graphics on the PCs. The lab files may be accessed outside of lab hours by connecting to nit over the net. The account on nit you will use is rt?, where ? is the number of the PC (e.g. rt2 if you are at wxpaos02). The lab computer goes with the nit account, so you will need to sit at the same computer each lab. The password on the lab PCs (for login atoc5560) is the same as on nit (for login rt?).

Computer procedures

Shutdown Microsoft Windows: Use **Shutdown, restart** option under **Start**.
Watch for the redhat screen with a list on the right of "dos" and "linux".
  Once this appears you have 5 seconds to select linux (by using downarrow and Enter).
Wait for linux to boot. X windows will start automatically.
At the login prompt, type in the "atoc5560" username.
Type in the password:
The Gnome window manager will start automatically.
  A task bar appears on the bottom of the desktops.
  The left most button (with a footprint) is like the Start menu button in MS Windows.
  There are buttons on he task bar for starting Netscape, opening a local terminal window, etc.
  There are four virtual desktops that can be selected.
Click in a window to activate it.

Open terminals on nit by clicking on the terminal icon with graphs in it.
  You will be asked for your password.

To stop for the day: type "exit" from each nit terminal.
Click on the Gnome footprint button, select Logout, then choose Restart to reboot.

You should create a directory on nit for each lab:
  mkdir lab1
  cd lab1

Text editors: There are four text editors you can use to modify Fortran programs, IDL procedures, csh scripts, etc.

 `vi`   standard Unix visual editor
 `memacs`   Micro EMACS (functions keys defined for this)
 `pico`   standard Pine editor (simple to use)
 `xedit`   simple X window based editor

Print MicroEMACS help file with `lptext10 /usr/local/bin/emacs.hlp`.

I suggest using one nit terminal window for editting the Fortran or IDL file, one for running IDL, and one for typing Unix commands.

IDL: We will edit and run IDL procedures for simple calculations and graphing. Start IDL by typing `idl`. Run the IDL procedure with, for example, ".run planck". You can use the arrow keys to retrieve and edit previous IDL commands. Use "print, ..." for examining IDL variables (e.g. "print, temps"). End IDL with "exit".

Generally you will be able to select X windows or Postscript graphical output in the IDL procedure with the "out" variable. Note: you can view the Postscript output using "gv", e.g. `gv PlanckSpectrum.ps` from the Unix prompt.

Fortran: Use pgf77 to compile a Fortran program:

   `pgf77 -O2 -o lbltau lbltau.f`

Or use g77 to compile a program:

   `g77 -O2 -o lbltau lbltau.f`

Just type the name of the executable (e.g. `lbltau`) to run the program. We will also be running programs from csh scripts.

Printing from nit: There are two printers in the weather lab, wxpaos10 and wxpaos11. If you want to print a text file, use "lptext10" or "lptext11". For printing a Postscript file, use either "lpps10" or "lpps11" (e.g. `lpps11 PlanckSpectrum.ps`).

Connecting to nit from the net: The only access to nit is with ssh (secure rsh) or scp (secure rcp). Type `ssh rt2@nit.colorado.edu` to login to account rt2. The secure shell, ssh, is available on many Unix computers on campus. If your computer doesn't have ssh, login to one that does, and then log into nit. You can copy files from nit to a computer with ssh using scp: `scp rt2@nit:lab1/planck.f ..`