

**(Astro)Physics 343 Lecture # 3:
Data Analysis & Statistics**

Scheduling

For analysis weeks, we will hold optional “on call” office hours at lab times in addition to regular office hours. This week:

Sections A & C: Baker, Serin 309W

Sections B, D, & E: Fadely, Serin 332W

Next Monday:

+ lab report # 1 due

+ observations for lab # 2 will begin

Next Tuesday:

special talk at noon in Serin 401 by Dr. Rosanne DiStefano

Lessons from last week's observations

Make sure to end an observing session by stowing the telescope and clicking the “Exit” button (not just closing the Java window).

The azimuth and elevation that are recorded in the *.rad files correspond to the current position of the telescope (not the Sun).

For optimally efficient observing, (a) sequence similar offsets together to minimize slewing, and (b) be cognizant of whether target will be rising above or setting below a critical elevation.

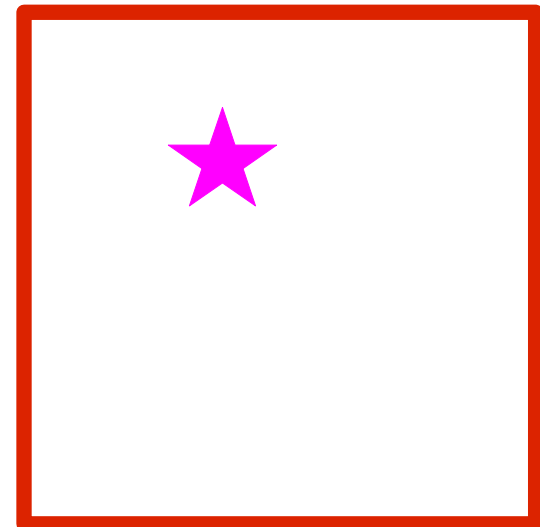
Do not use the “calibrate” button!

Pointing

From compiling all of the npoint data, it's clear that the telescope's pointing solution is not perfect and varies with position on the sky.

Sun tended to show up at somewhat higher elevation and lower azimuth than expected, with severity of pointing error depending on sky position.

Keep this in mind when you compare your datasets!



For next week: useful DOS commands

Taken from a more complete list at

http://en.wikipedia.org/wiki/List_of_DOS_commands...

cd = change to a different directory

copy = copy a file to a new location and/or new name

del = delete a file or directory

dir /p = list contents of current directory, one page at a time

mkdir = create a new directory

more = print a file on screen, one page at a time

move = move a file to a new location and/or rename it

For this week: loading data into Excel

Tips from Alex Merced...

- (1) Copy the original raw data file into a safe backup version, since Excel actually works directly on any input file.**
- (2) Click File → Open (set filter to select all files).
Proceed to the “Text Import” wizard, and read in delimited input (deselect tab, select space as delimiter; treat consecutive delimiters as a single one).**
- (3) As a fallback, you can use the “Text Data to Columns” button to access the “Text Import” wizard.**

Regarding lab reports...

Do include:

- (1) a brief description of the purpose of the observations**
- (2) a brief description of the observations (e.g., how many data points per offset? was the script modified in any way?)**
- (3) a description of your analysis (number-crunching)**
- (4) a discussion of your results (plots and sketches help; consider your sources of uncertainty)**

Do not include:

- (1) the full script**
- (2) the raw data**

Write in active voice, and be faithful to the data!

Errors: random and systematic

When we make a measurement, we do so imperfectly due to both **random** and **systematic** errors.

Random errors average away with more measurements.

We often assume that these follow a Gaussian probability distribution (more on this in a moment).

Systematic errors do not average away. Getting more data doesn't always help!