

LESSON #5 UNDERSTANDING YOUR DATA

1. Don't start the SRT program. This lesson will use the data recorded in lesson #4.
2. Open your data file. Notice the large grid of numbers. Each row contains data taken by the telescope at a particular time.
3. Let's try to understand what each column means. The first 11 fields describe the data.

time (yyyy:ddd:hh:mm:ss)	azimuth(deg)	elevation(deg)	azimuth offset(deg)	elevation offset(deg)	first frequency(MHz)	digital frequency separation(MHz)	first frequency channel	second frequency	digital mode	number of frequencies in digital mode
* STATION LAT= 42.70 DEG LONGW= 71.50										
2004:205:14:13:10	111.2	49.6	0.0	0.0	1414.88	0.00390625	64	11.1	13.8	24.2
2004:205:14:13:13	111.2	49.6	0.0	0.0	1414.88	0.00390625	64	11.3	14.1	24.4
2004:205:14:13:16	111.2	49.6	0.0	0.0	1414.88	0.00390625	64	11.1	13.6	24.2
2004:205:14:13:19	111.2	49.6	0.0	0.0	1414.88	0.00390625	64	11.3	13.9	24.4
2004:205:14:13:22	111.2	49.6	0.0	0.0	1414.88	0.00390625	64	11.1	13.8	24.4

This data was taken with a central frequency of 1415 and mode 2. The bandwidth was 0.25 MHz. This means the first frequency should be 1414.88 MHz, and it is! This mode has 64 bins meaning it takes data at 64 frequencies between 1414.88 and 1415.12 MHz. The separation between the frequencies at which data is taken should be $(0.25 / 64 =)$ 0.0039, and it is!

4. Because we were in a mode with 64 bins, there will be 64 columns of data. After the data is a column of vlsr measurements

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
5.9	258.1	161.9	93.0	48.4	24.0	13.6	vlsr	10.17
4.1	252.0	161.5	93.0	48.4	24.0	13.9	vlsr	10.17
1.0	255.4	164.3	93.0	48.4	24.0	3.8	vlsr	10.17
3.5	246.8	166.8	93.0	48.4	24.0	3.9	vlsr	10.18
1.8	252.6	165.1	93.0	48.4	24.0	3.8	vlsr	10.18
0.8	251.1	162.1	91.0	48.1	23.7	13.6	vlsr	10.19

data

vlsr stands for **V**elocity relative to the **L**ocal **S**tandard of **R**est. Later, we'll use this information to chart the rotation of the Milky Way.

5. Close your data; you're done.