

EXCEL TUTOR FOR Ex. 20.0

Entering Data for the Radial Velocity Curve

1. First open EXCEL by clicking on the EXCEL green icon on the main page or the bottom menu bar.
2. Click on the box in column A row 1. Values in column A are plotted along the x-axis.
3. Type the first data entry, e. g. phase, in the box on row 1 under column A. Make sure that phases are placed in order from 0.01 to 0.999 or EXCEL will not plot the data correctly.
4. Tab to column B and enter the corresponding value for the y-axis, in this case radial velocity for star 1.
5. Tab to column C and enter the corresponding value for the radial velocity for star 2.
6. Press Enter to get to the next blank row and continue entering all the other data the same way that you did for the first row
7. Copy all data with phases between 0.00 and 0.12 and add these data at the end of both columns. Now add 1.00 to the phases for these extra data points but do not change the radial velocity data. For example, phase 0.0123 becomes 1.0123. To do this, click on the first box in column A of the repeated data and type: =A1+1. Then press enter. Then click on dark square in the lower right corner of the box and drag down the column to the end of the data. This will then add 1 to the phases. This is done so that we see more than 1 orbital cycle on the graph, which makes it easier to analyze the radial velocity curve.

Plotting Radial Velocity Curve Data

1. Click on column **A**, and drag over to include columns **B and C**. These data are now highlighted in blue.
2. Click on “Insert“ in the tool bar at the top of the page.
3. Now click on the option ”**scatter**” in the charts section. This will open a new window of options. Click on the sample picture showing just data points to be plotted instead of a line connecting the data points. When you do this your data will be plotted.
4. If it is desired to change the type and size of the symbols, right click on the plotted symbols in the graph and now select “format data series,” then “marker options,” then “built in,” and then select the type of symbol and size. Make the size to be 8.

Formatting a Graph

To dress up a plot to be printed and handed in or included in a report, proceed as follows:

1. Click on the graph and then on “Layout”, not “Page Layout” in the top menu bar.
2. Now click on the “axis title” icon and select the primary horizontal and vertical axis options in turn. Under horizontal axis choose “title below axis” and for the vertical axis title choose “rotated title.”
5. Enter “Orbital Phase,” in the horizontal axis text-box labeled “axis title” and enter “Radial velocity,” in the vertical axis text-box. You should also give the graph a title such as “Radial Velocity Diagram for PB1.”
6. Then go to “Home” and change the font to “Times New Roman,” size 16.
7. Click on the box to the right of the plot area that says “Series 1” and then press the delete key.
8. Now click on the corners of the frame encapsulating your graph and stretch to maximum size on the available screen area.
9. Now right click on the plot area **between the lines** and then on one of little squares that appears at the edge of the plot area. Now drag to enlarge the plot area within the graph window to maximize it without crowding the axes labels.

10. Now click on the tab in the upper left corner of the screen labeled “FILE” and then select print. The print preview should open and you can see how your graph fills the page. If the graph is to be a single page in your report, adjust the size until it fits the entire page. Also set your print options to have the graph be in landscape format. Before you print, have your instructor check your chart to make sure it is correct. Then print the graph.

Y value for Location of x-axis data labels.

1. To have the x-axis data scale moved to the bottom of the plot when you have y-data that goes negative, right click on one of the y-axis label numbers. A menu opens and select format axis.
2. Then click on the choice to enter the value for x-axis to cross the y-axis. Type in the y-axis value, which should be an number slightly more negative than your largest negative radial velocity. and then close.

Print out your graph and then draw by hand a smooth, continuous curve that best fits your radial velocity curves for each star, adhering to the criteria given in Ex. 20.0. It should be drawn in such a way that it looks similar to the diagram shown at the bottom of page 165 in the Manual.