Velocity Curve Activity Part 1: Quadrant II & III Conclusions

Introduction

Here you will compare the class observations of the Milky Way Galaxy (MWG) in quadrants II & III of the galactic plane, and draw conclusions. What can these results tell us about the MWG?

1. Comparison of Class Data

Galactic Longitude	*Quadrant*	*Velocity (km/s)*	*Uncertainty (km/s)*	*Red or Blue shift?*

2. Estimate an uncertainty

The Milky Way galaxy is extremely large in comparison to our solar system. However, the motion of the earth around the sun can contribute to the red or blue shift of an HI peak in the spectrum. If we know exactly how the earth is moving relative to the direction of our observation, we can make a peak shift correction.

However, this is a little more advanced than we need to be at this point. We will simply take the velocity of the earth relative to the sun as an uncertainty in our measured velocity values.

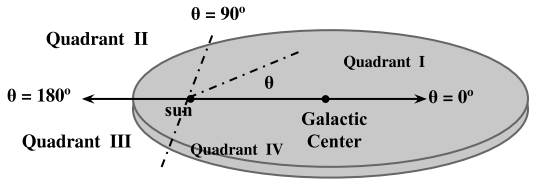
Calculate the orbital speed of the earth around the sun. The earth travels at an average distance of $1.50 \times 10^{11} m$ from the sun. Show your work:

Speed of earth around the sun in km/s: _____

Record this as your uncertainty in the table above.

3. Conclusions

Refer to the diagram of the MWG below to help you draw conclusions about the results in the table above. The velocities refer to the velocity of the detected HI relative to the sun.



Study the results in the table and draw conclusions about what they imply about the motion of the MWG. Provide an argument to support your conclusions.