Lab 1 – Measuring the Size of the Field of View

The procedure for this lab is very straightforward. Determining results and their significance will be up to you. All observing notes, calculations, and answers to questions should be done in your lab book, which you will turn in.

Procedure

Chose a low power eyepiece. Find a fairly bright star as close to the celestial equator as possible. Be sure to record the name of the star, its coordinates, and the power of the eyepiece.

Use the paddle to move the telescope so that the star is at the easternmost point of the field of view. I leave it to you to determine which direction is east. Now move the telescope a bit more until the star moves out of the field of view. Have your stopwatch ready.

Have your partner turn off the telescope tracking. When the star re-enters the field of view, start the stopwatch. Stop it when the star moves out of the field on the other side.

Repeat this procedure for at least one other eyepiece.

Analysis

Determine the rotation speed of the Earth. This is easy to calculate in degrees/hour (think about it long enough and it will come to you). Convert this to arcmin/s. Armed with this knowledge, determine the size (in arcmin) of the field of view of your eyepieces.

Questions

How did you determine which direction was east in your field of view?

Why/how does this procedure tell you about the field of view?

How did you find a star on or very near the celestial equator?

Why does the star need to be near the celestial equator? What would happen if it were nearer to the north celestial pole? What if you used Polaris?

Briefly outline a similar procedure to determine the angular separation of two objects or the angular diameter of the moon or a planet. There is a way to do this *without* having to "estimate" anything or even to know what the size of your field of view is. Tell me how.