

Homework 1, Astr 505, Fall 2008

Due date: September 2

1. The earth's precession has a period of about 26,000 years, during which time the rotation axis sweeps a circle on the sky due to rotation of the earth's rotation axis with respect to the orbital plane of the earth around the sun.

Is the change in position (i.e. the angular shift in the sky) for an object that results over the period of, say, one year, the same for all objects in the sky or will it vary depending on the position of the object? Explain your answer.

2. What is the angular separation (length of the arc in degrees) between these two positions in the sky? (Use the spherical triangles to calculate the result). Position 1: RA = 12hrs DEC= 40 degr, Position 2: RA = 14 hrs, DEC=22 degr.

Would it be different if I added 10 degrees to each of the declinations, but kept the RA the same?

Would it be different if I kept the declinations the same, but subtracted 2hrs from each of the RAs?

3. Calculate the proper motion (in arcsec/year) of a star that is at a distance of 10 pc from Earth, and has a tangential velocity (i.e. velocity perpendicular to our line of sight to the star) of 20 km/s.