

Remote Sensing Homework

Spring 2007

Please answer in complete, coherent sentences and show all work!

Orbits and Instruments: Due Wednesday, 1/31/07

1. How high above the Earth's surface would a satellite's orbit need to be to achieve a geostationary orbit (show calculation). What must be the sign of its inclination and why?

2. Calculate the velocity the satellite in (1) needs to maintain this orbit. Give your answer in metric units and also convert to MPH.

3. A satellite in a sun-synchronous orbit carries an instrument that has a cross-track scan rate of 6 scans s^{-1} . What altitude must the satellite have for the scan lines to be 1 km apart along the nadir ground track? Tip: refer to Fig. 2.16 in KVH.

4. Define the following terms -- use a diagram when helpful:
 - a. geostationary orbit

 - b. perigee/apogee

 - c. inclination angle

 - d. prograde/retrograde orbits

 - e. ascending/descending nodes

 - f. sun-synchronous orbit

 - g. ground track

 - h. Keplerian orbit

 - i. IFOV vs. FOV