CE 603 - Spring 2005 - Homework 1

Design a 1m GSD satellite camera for the panchromatic (visible) wavelengths. Use the Kodak KLI-8811 linear array, collect an 8k x 8k scene. Make a recommendation for altitude, aperture size, focal length. Show all supporting and intermediate steps. Evaluate consistency of sampling and diffraction limit, assuming high quality optics. Perform analysis under scenarios/assumptions:

- Classic pushbroom operation (line rate depends on Vg, due only to satellite motion & nadir pointing), or "synchronous scanning"
- Flexible pushbroom operation where you may decrease Vg by up to 5x (or increase dwell time by up to 5x) using continuous rotation of the camera during scene capture, or "asynchronous scanning"
- Your aperture diameter is limited to be no more than 0.8m. You can achieve any, arbitrary Vg by controlling the camera rotation at any rate. Determine the rotation rate necessary for scanning
    - Along-track in the forward direction
    - Along-track in the backward direction
    - Cross-track (assume for all of these that you are scanning in the vicinity of the nadir point)

Assigned 19-Jan, due Friday. 28-Jan.