ASSIGNMENT 8 – GPS LEAST SQUARES – KNOWN A PRIORI

Due Date: MONDAY, November 11.

This is an individual assignment worth 50 points. Please submit your answers and code to the D2L dropbox.

Using the same files (observation and navigation) and instructions (correct tropo delay, relativity, satellite clock) from assignment 7, with the following provisos.

1. Only use ionosphere free pseudorange. Use P1 if it is available. If not, use C1.

2. Do not iterate on receiver coordinates. Everything should be shown with respect to the *a priori* receiver coordinates in the RINEX header.

3. You must compute the latitude, longitude, and height of the *a priori* receiver coordinates using code (i.e. no hardwiring). Furthermore, you cannot assume the Earth is a sphere! It ain't. There was code to make this conversion (using WGS84) in the Ben Bradley code-fest. If you can't find that, let me know and I will give you mine.

4. Use elevation cutoff of 10 degrees.

You are absolutely **are** allowed to use the Ben Bradley broadcast ephemeris code. If your geometric range code never worked, let me know and I'll send you mine.

The goal of this assignment is to estimate deltaX, deltaY, and deltaZ, and receiver clock for each epoch. I believe the files each have 120 epochs in them. So I would like you to estimate these parameters for each epoch, convert them to deltaE, deltaN, and deltaV (you have to estimate the receiver clock, but I do not need to see them.) Turn these in:

1. Plot of ENV in meters (y-axis) and time (minutes) on the x-axis. One plot for each site.

2. 1. Plot the standard deviation for ENV in meters (y-axis) and time (minutes) on the x-axis. To do so, assume that the observation uncertainty (ionosphere pseudorange) is 0.5 meters (remember, if you don't have a data uncertainty, the variance-covariance matrix does not have units.)

3. So that we can check your code, pls turn in these East, North, Vertical and Clock estimates and their standard deviations in meters for the second epoch (why not the first epoch? I am going to email you the answers for the first). Please only give answers to 3 decimal points.

4. Please let me know if I have missed providing any needed files.