AA575: Satellite Navigation

Homework 1: GPS Signals and PRN Codes

Assigned:
Due: Friday, September 23, 2011

Problem 1 (60 Percent): Write a program to implement the C/A code generator for PRN 22 and 27. Use this to generate the first 32 chips in the sequence for each PRN. You can check the first 10 bits in your code against table 3-I in reference GPS-IS-200E). Octal notation, where each octal digit represents 3 binary digits, is used in that table.

Problem 2 (40 Percent): Use your code generators to modulate BPSK signals, and generate the following plots:

1. Autocorrelation of PRN 22 for $-10\text{chips} \leq \tau \leq 10\text{chips}$.
2. Autocorrelation of PRN 27 for $-10\text{chips} \leq \tau \leq 10\text{chips}$.
3. Crosscorrelation between PRN 22 and PRN 27 for delays of $-10\text{chips} \leq \tau \leq 10\text{chips}$.
4. Note the values taken by each peak in the ACF's and CCF's, and compare these values with those given in *Misra and Enge* on pages 365-367 (equations 9.36-9.39 and figure 9.14).