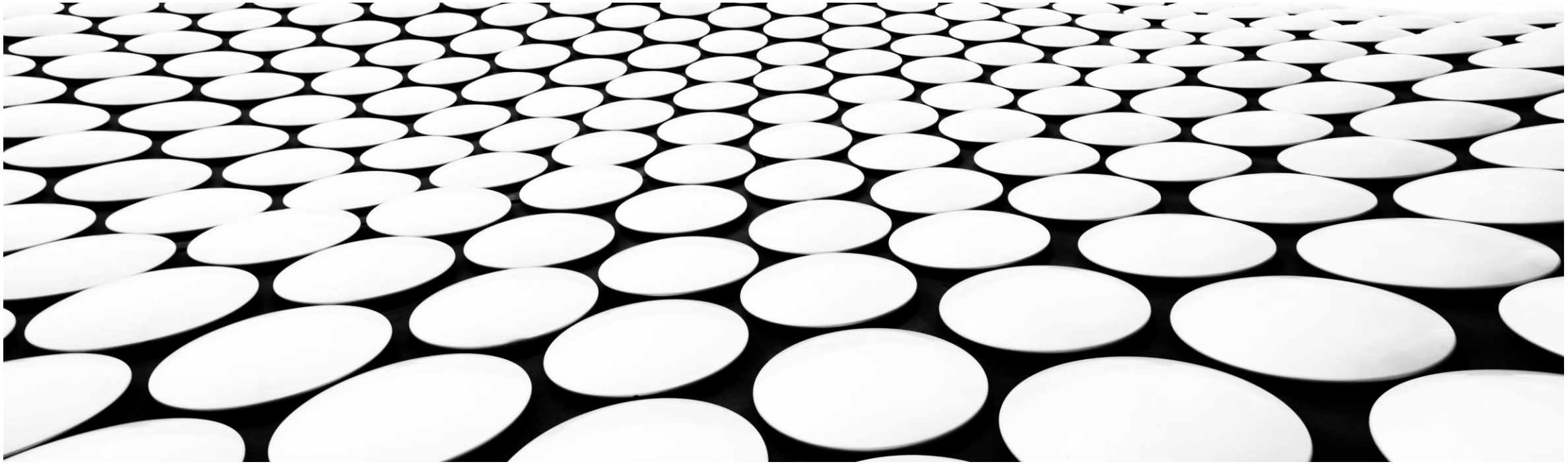
GPS: CRITICAL DESIGN REVIEW

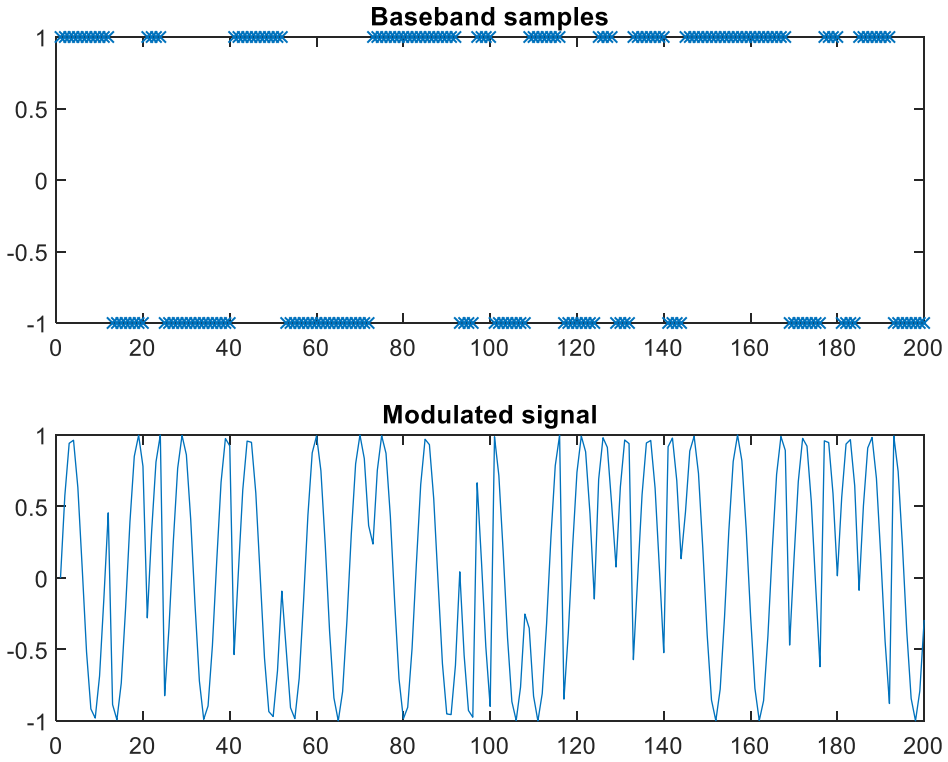
SYSTEM IMPLEMENTATION RESULTS

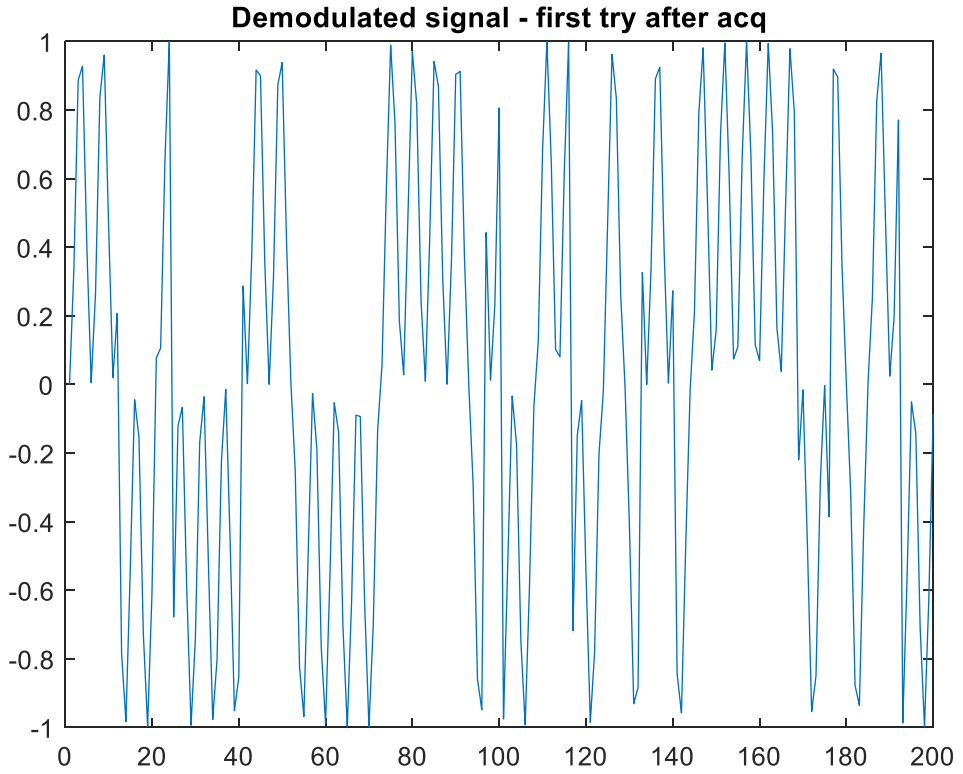


WHAT WAS ACCOMPLISHED

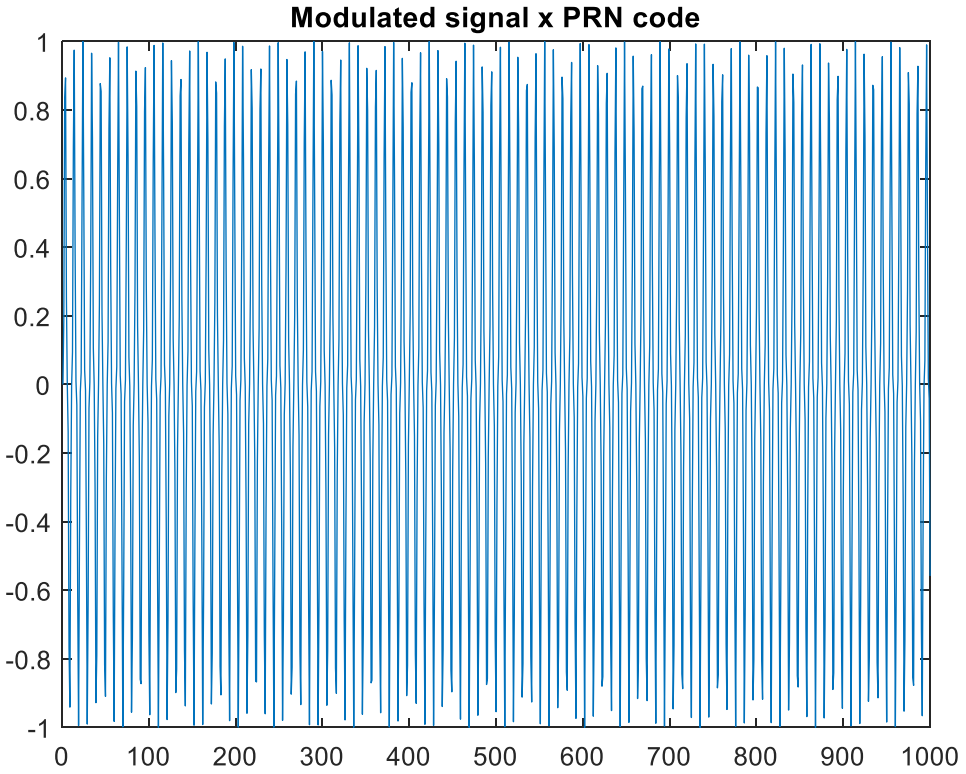
- Signal Generation
  - Produce data bits, spread by chips for user-specified PRN
- Acquisition
  - Produce carrier frequency estimate via Parallel Frequency Search
  - Produce code phase offset to ¼ chip
- Carrier Tracking
  - Reveal carrier by code multiplication
  - Track carrier with Costas PLL
- Code Tracking
  - Batch processing of 1ms of samples at a time via EPL

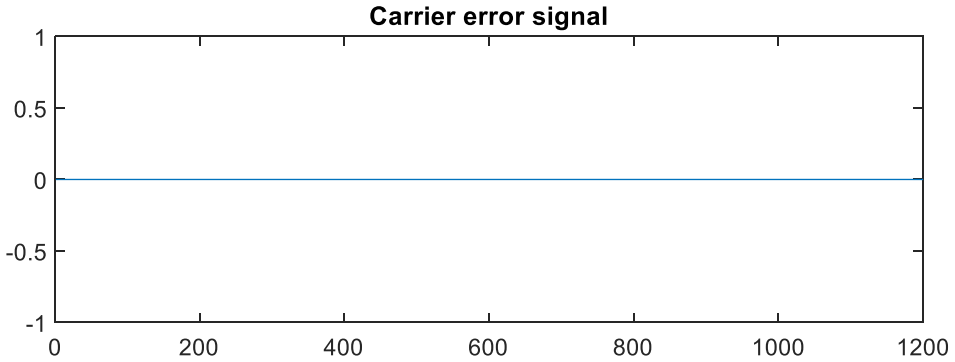
TEST CASE: CLEAN BPSK DATA

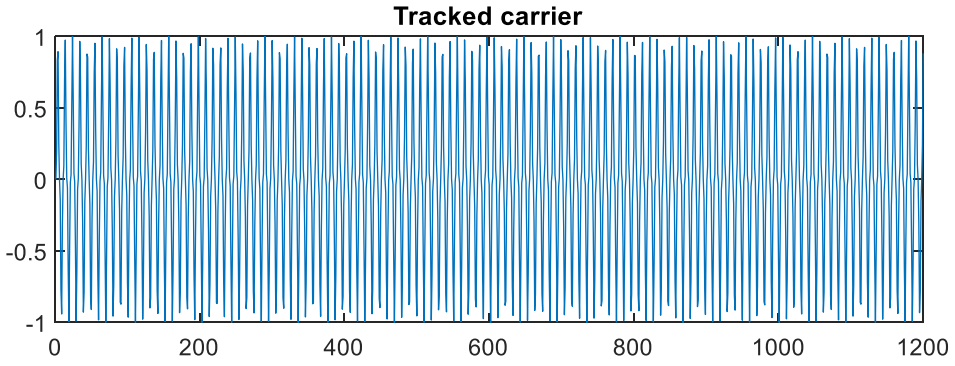




TEST CASE: CLEAN BPSK DATA - CARRIER

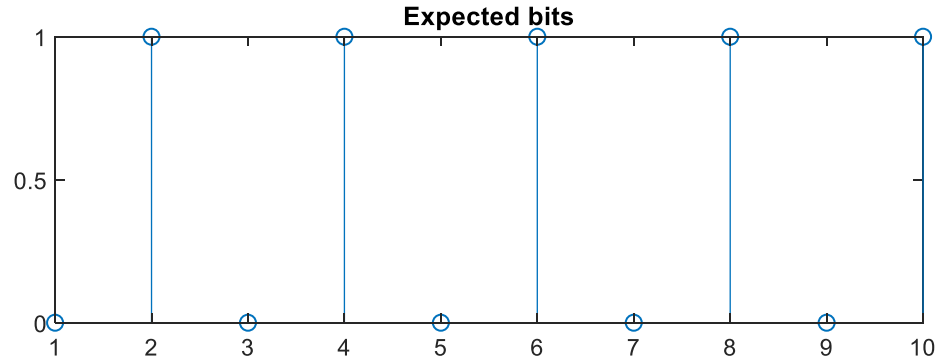


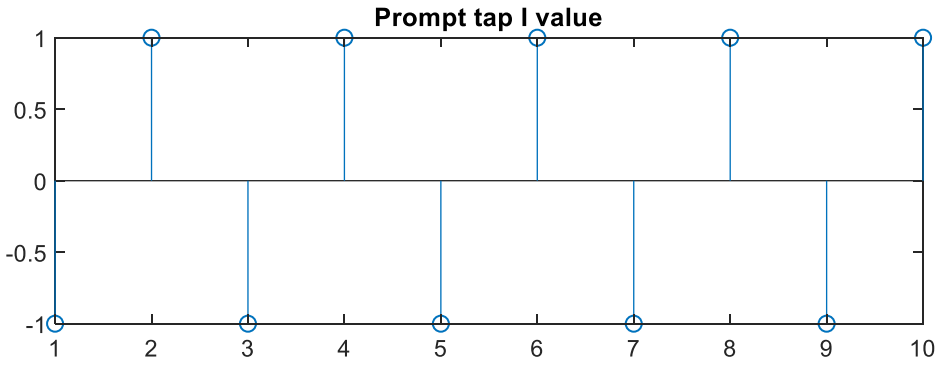




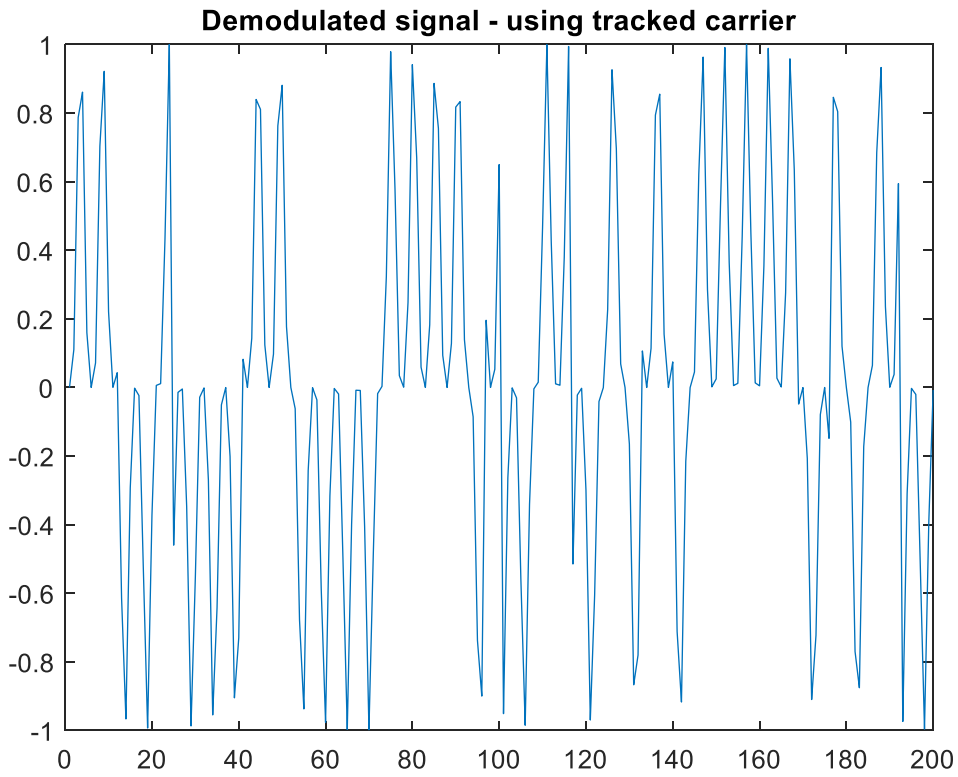
CLEAN DATA: CODE TRACKING

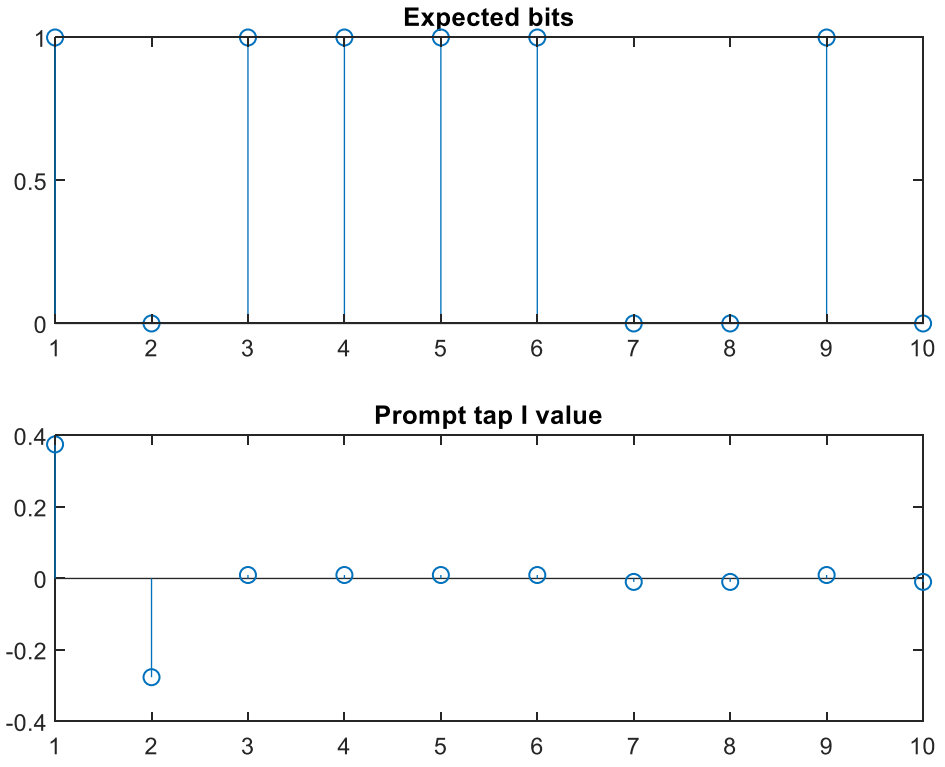
- Simple test of EPL/integrate & dump
- Clean baseband signal
- No CFO applied



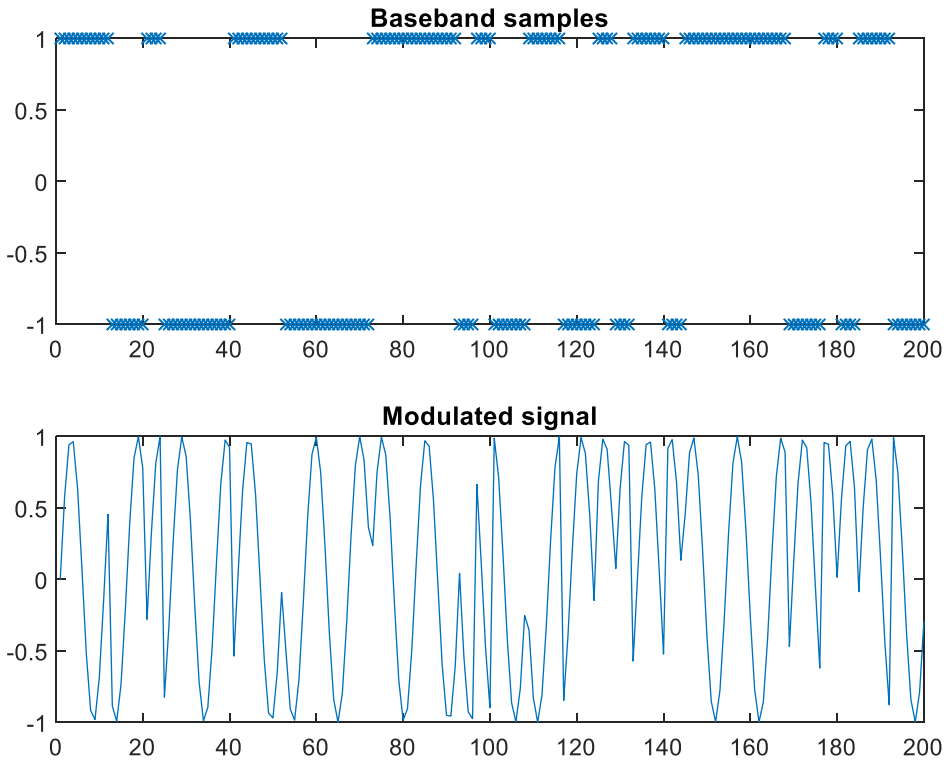


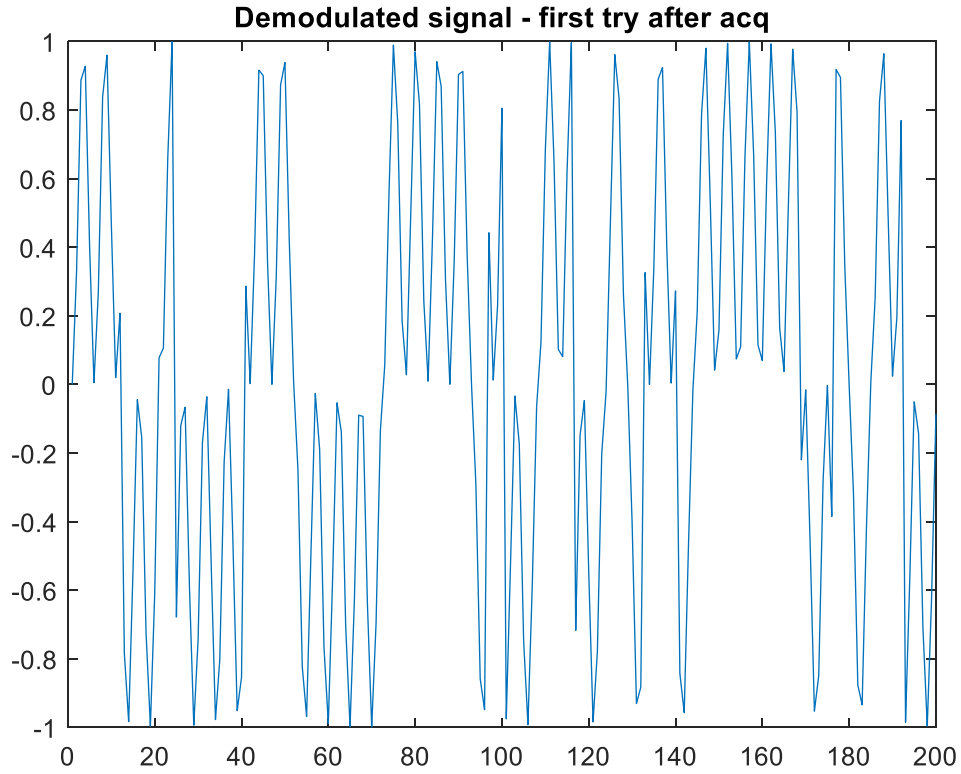
TEST CASE: CLEAN BPSK DATA



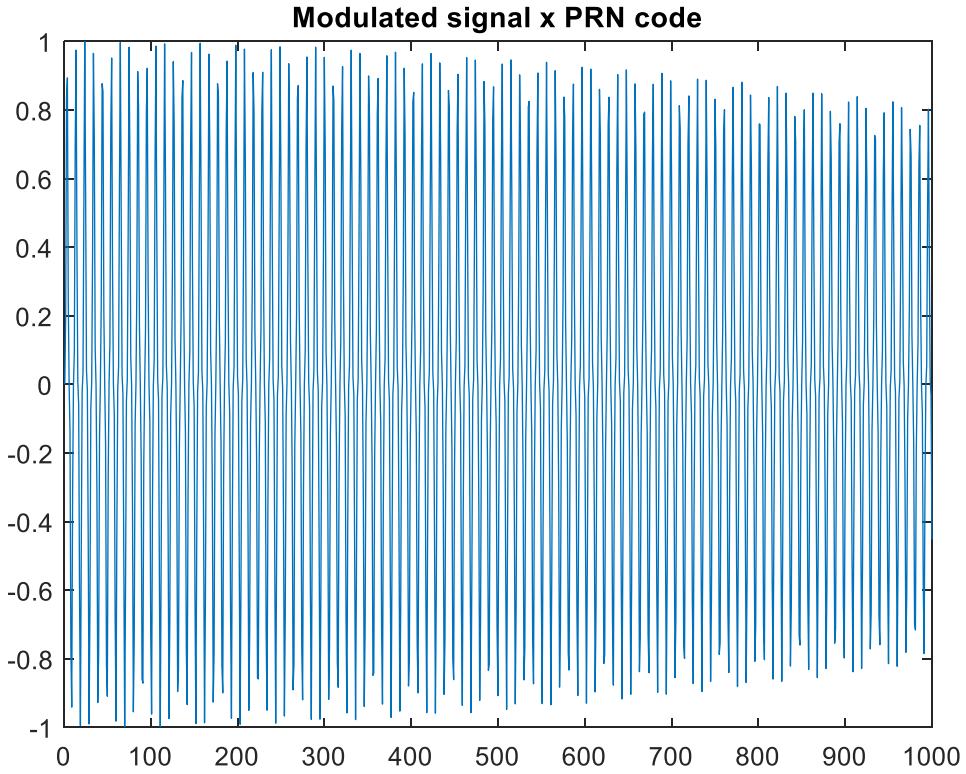


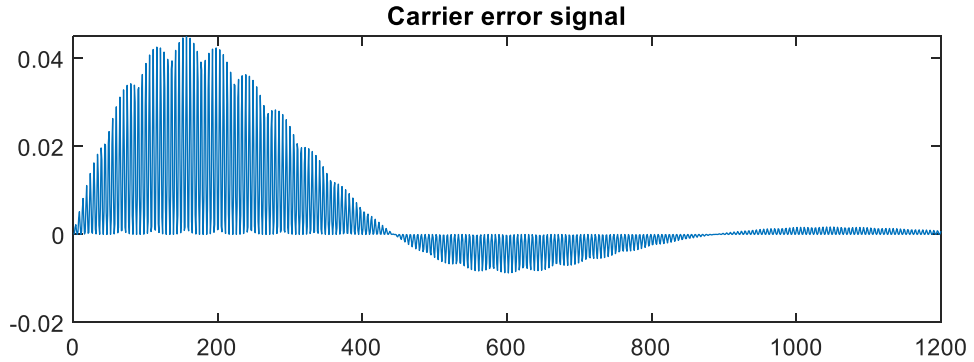
TEST CASE: CARRIER FREQUENCY OFFSET

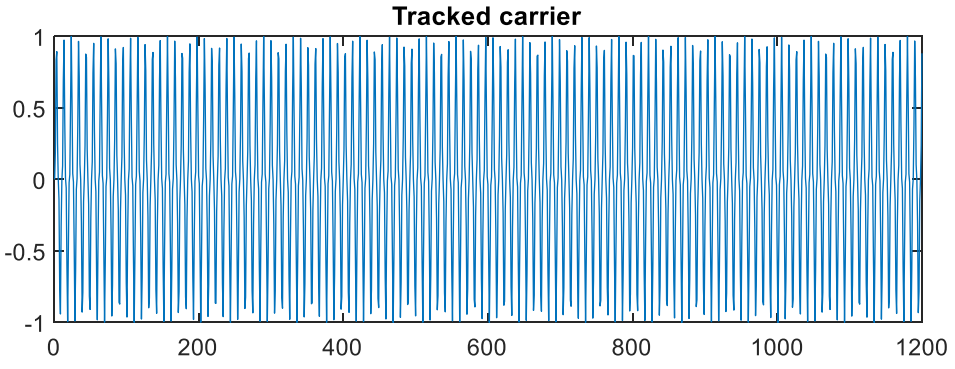




TEST CASE: CARRIER FREQUENCY OFFSET







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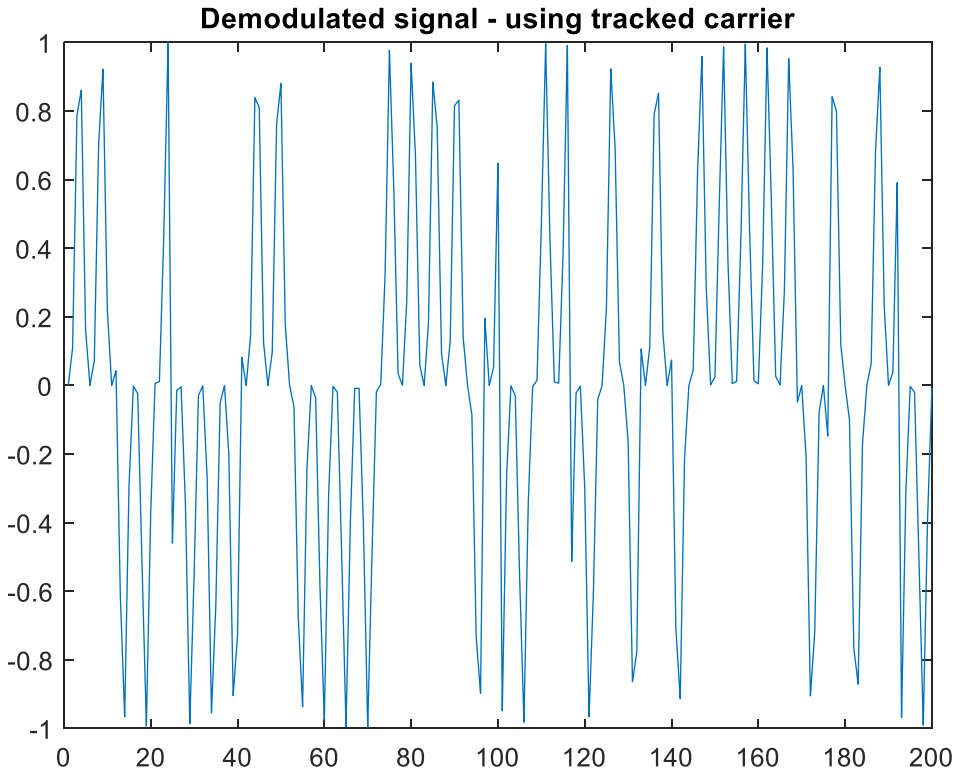

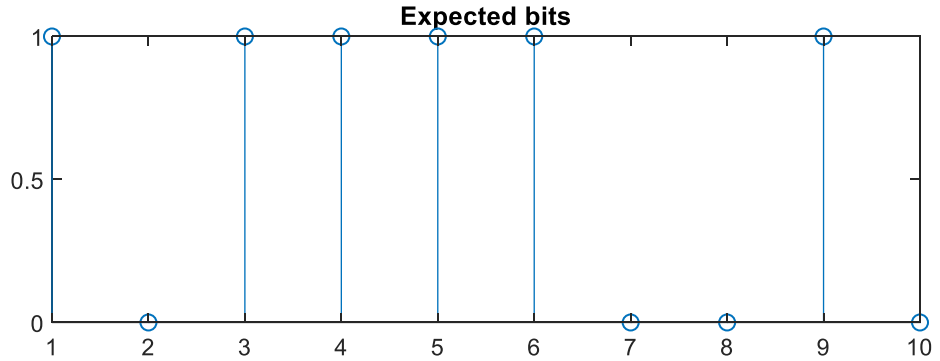

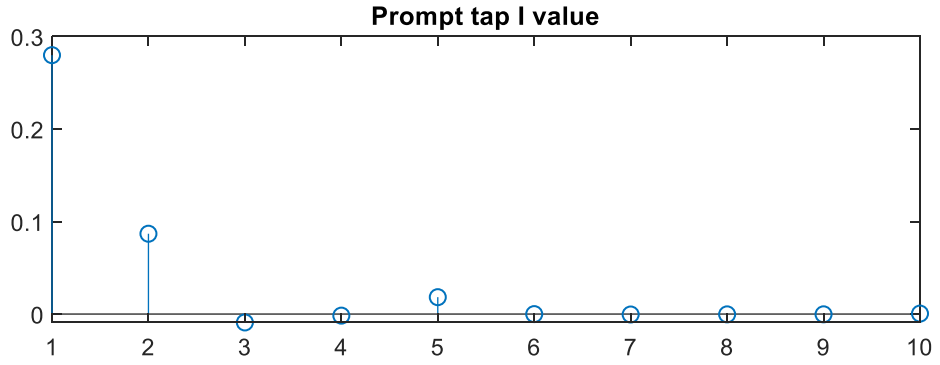

REMAINING SYSTEM IMPROVEMENTS

- Signal Generation/Sampling
  - Need accurate depiction of L1 carrier
- Repair Code Tracking
  - Prompt tap I/Q diminishing in magnitude
- True Combined Tracking
  - Carrier and code loops are independent feedback systems
  - Should feed each other