October 31, 2023

ECEN 620

Homework #4

Due: 11-7-2023, 11:59PM
Homeworks will not be received after due.
Instructor: Sam Palermo

1. Let's consider a second-order digital PLL that utilizes the PI filter from Lecture 9.

F_{ref}=156.25MHz
N=16
Δ_t=10ps
$(V_{FS}/2^B)K_{VCO}=2\pi*5$MHz/LSB

- Follow the Lecture 9 design procedure and find the loop filter parameters α and β for f_u=5MHz and Φ_m=60°.
- Implement a linear macromodel (MATLAB, etc.) for the closed-loop system.
  - Plot the open-loop gain magnitude and phase and find the phase margin.
  - Plot the output phase transfer function (magnitude only) from 10kHz to 1GHz.