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Lab 7 – PLL

For the lab we were given some questions to answer:

* What is the relationship between the phase error and the two sinusoids?

The phase error will decrease as the two sinusoids have their phase line up.

* What is the significance of the initial phase error?

The initial phase error is at 1.52, or pi/2. This shows us how many radians we are off.

* How long did it take for the PLL to lock?

About 830 samples we get within .001 radians of the expected phase.

* What is the relationship between lock time and the closed loop bandwidth?

The broader bandwidth we have, the faster the phase lock happens

Next set of questions:

* What is the relationship between the phase error and the two sinusoids?

The phase error will decrease as the two sinusoids have their phase line up.

* What is the significance of the initial phase error?

The initial phase error is the value of pi, or the phase of the sinusoid.

* How long did it take for the PLL to lock?

It took 100 samples more to lock.

* What is the relationship between lock time and the closed loop bandwidth?

Like I said, the broader bandwidth we have, the faster the phase lock happens.

Third set of questions

* What is the relationship between the phase error and the two sinusoids?

It never converges to a phase of zero

* What is the significance of the initial phase error?

It is the initial phase of the sinusoid passed into our phase detector

* How long did it take for the PLL to lock?

It technically locks at like 1200 samples, but not on the phase of 0.

* What is the relationship between lock time and the closed loop bandwidth?

Like I said, the broader bandwidth we have, the faster the phase lock happens.

* How do your observations compare with the first row in Table C.1.1 (p. 724)?

They aren’t exactly the same