UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Department of Electrical and Computer Engineering

ECE 498MH SIGNAL AND IMAGE ANALYSIS

Homework 10

Fall 2013

Assigned: Friday, November 22, 2013

Due: Friday, December 6, 2013

Reading:

Problem 10.1

(a) $P_{ss}(\omega) = \left|\frac{1}{1-ae^{-j\omega}}\right|^2 = \frac{1}{1+a^2-2a\cos\omega}$. The sketch should show $P_{ss}(0) = \frac{1}{1-2a+a^2}$, $P_{ss}(\frac{\pi}{2}) = \frac{1}{1+a^2}$, and $P_{ss}(\pi) = \frac{1}{1+2a+a^2}$. For real-valued a between $0 \le a < 1$, this is a lowpass spectrum.

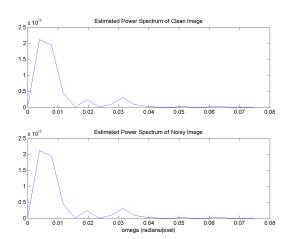
(b)
$$P_{vv}(\omega) = 1$$

(c)
$$H(\omega) = \frac{P_{ss}(\omega)}{P_{ss}(\omega) + P_{vv}(\omega)} = \frac{1}{2 + a^2 - 2a\cos\omega}$$

Matlab Exercises

Problem 10.2





Homework 10 2

