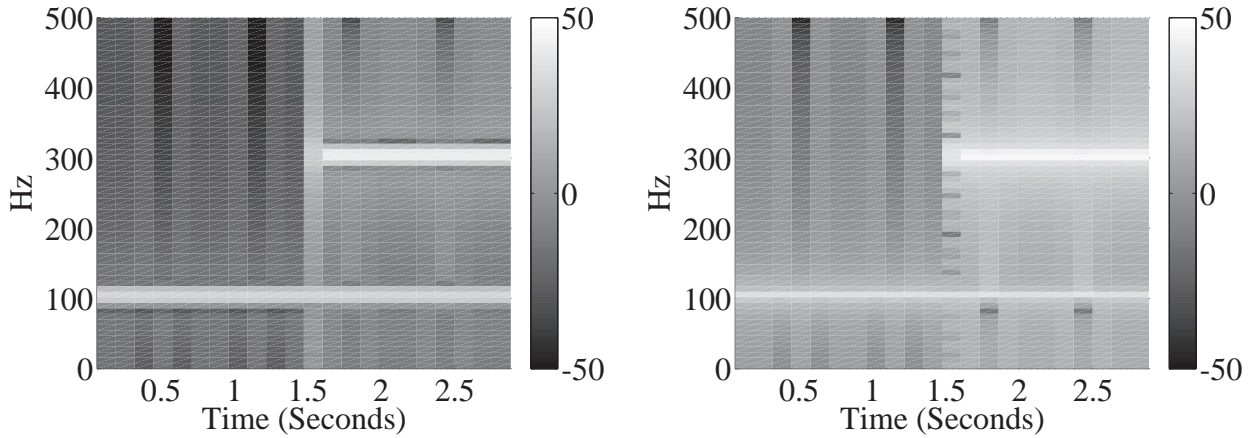


ECEn 487 - Introduction to Digital Signal Processing

Winter 2013

Quiz 12

1. I sampled a signal at a rate of 1 kHz. I then produced two spectrograms of the signals using a Hamming window and a rectangular window, both of length $L = 2^n$. The color scale is in dB.



a) (2 pts) Which spectrogram was produced with a Hamming window? How can you tell?

b) (2 pts) What is the length of the window used?

2. Suppose I have white noise with variance σ_x^2 as an random variable input X to an LTI system with impulse response resulting in a output random variable Y .

$$h[n] = \begin{cases} 1, & n = 0 \\ 2, & n = 1 \\ 3, & n = 2 \\ 0, & \text{otherwise} \end{cases}$$

a) (2 pts) What is the mean of Y ?

a) (2 pts) What is the cross correlation ϕ_{yx} ?

b) (2 pts) What is the autocorrelation ϕ_{yy} ?