Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.432 Stochastic Processes, Detection and Estimation

Recitation 14 Outline

May 12, 2004

Estimation and Detection Using Periodograms

1. Stationary Processes, Long Observation Times (SPLOT)
   - Relation to Karhunen–Loeve expansions
   - Noncausal Wiener filter
2. Periodogram
   - Definition and implications of SPLOT conditions
   - Log likelihood function for Gaussian problems
   - Relation to other whitening methods
3. Example applications to Gaussian estimation problems
   - Estimation of parameterized power spectral density:

$$S_{\mathsf{yy}}(e^{j\omega}) = \begin{cases} \sigma_1^2 & |\omega| \leq \omega_0 \\ \sigma_2^2 & \text{otherwise} \end{cases}$$

   - Spring 2001 final exam, problem 3