



School of Electrical and Computer Engineering
Georgia Institute of Technology
ECE 6605 Information Theory
Spring 04



Homework #4

- 4.1 Problem 4.6 in Proakis.
- 4.2 Problem 4.9 in Proakis.
- 4.3 Problem 4.10 in Proakis.
- 4.4 Problem 4.11 in Proakis.
- 4.5 Problem 4.13 in Proakis.

Homework #5

- 4.1 Problem 4.15 in Proakis.
- 4.2 Problem 4.16 in Proakis.
- 4.3 Problem 4.23 in Proakis.
- 4.4 Problem 4.30 in Proakis.
- 4.5 Consider two passband waveforms

$$s_1(t) = A \cos(2\pi f_c t + \phi_1) u_T(t)$$

$$s_2(t) = A \cos(2\pi(f_c + \Delta_f)t + \phi_2) u_T(t)$$

where $u_T(t)$ is the unit height function of duration T seconds and where ϕ_1, ϕ_2 and are arbitrary random carrier phases. The condition $f_c T \gg 1$ is satisfied. Find condition(s) on Δ_f so that the signals $s_1(t)$ and $s_2(t)$ are orthogonal for all values of ϕ_1, ϕ_2 .