
Homework IV

1. (20%) Assume that there are L ($L = 1, 2, 3, 4$) diversity branches of uncorrelated Rayleigh fading signals. Each branch has the same average symbol energy-to-noise power ratio E_s/N_0 , for $E_s/N_0 = 1, 3, 5, 7$, and 9 dB. Simulate the QPSK bit error probability (at least to $P_b = 10^{-4}$) for (a) Selective Combining; (b) Maximal Ratio Combining; (c) Equal Gain Combining; and (d) Direct Combining (which combines all paths directly and then **compensates the overall phase shift** before demodulation).
(1. You may generate the fading gains via combining a Rayleigh random number and a uniform random phase, or via combining two Gaussian random variables (complex Gaussian). 2. For coherence detection, you must equalize the phase before demodulation.)
2. (20%) Repeat the problem for uncorrelated Ricean fading with $K = 1$.
3. (10%) Compare and discuss the results for different cases.
 - 助教: EECS Room 605, TWNTHUCOM5170@gmail.com
 - Due Date: **11/26** (You shall mail both your report and your program to the class mail account.)