EE608 Adaptive Signal Processing

Problem Set 8

1) Implement Sato's blind channel equalizer for:

   (a) BPSK data symbols and channel as specified

   $$h(n) = \begin{cases} \frac{1}{2}[1 + cos(\frac{2\pi}{F}(n-2))] & n = 1, 2, 3 \\ 0 & otherwise \end{cases}$$

   with $F = 4.5$ or greater.

   (b) QPSK data, with the channel as above.

   (c) BPSK data, but with a narrow band channel $h(n) = \begin{cases} 1 & n = 0, 1, ...9 \\ 0 & otherwise \end{cases}$

   (d) QPSK data with narrow band channel.

   (e) A channel of your choice.

   In all cases specify the variance of additive noise. Compare the results of the Sato's blind algorithm with the previous simulation where one had used the knowledge of the channel.

2) Implement the *Transform Based* LMS algorithm in the one step predictive mode. Use the data set for the LMS algorithm from Home Work No.3, Problem 8. Use any real transform; DCT or DWT. Comment on the convergence and MSE performance of the transform based LMS algorithm.