

ABSTRACT

The main problem in digital communication system is needed wide bandwidth for transmission process. Therefore bandwidth need to limited in transmitter. This limitation cause overlapping between near symbol, this is often called by Inter Symbol Interference (ISI).

In Quadrature Phase Shift Keying (QPSK) besides the problem of ISI, the other problems are crosstalk and noise. Crosstalk happen because effect of interference between inphase hand and quadrature hand. ISI, crosstalk, and noise cause signal distortion, therefore happened error detection in receiver.

One of methods to decrease ISI, crosstalk, and noise in QPSK is add adaptive equalizer in QPSK demodulator. Algorithm is used to adapted weight in this final project is Recursive Least Square (RLS) algorithm. The RLS algorithm convergence is faster than LMS (Least Mean Square) and the steady-state value of the mean square error is smaller than LMS.

From simulation result can be concluded that order 4 give optimum result. In condition channel change every 50 symbol, the biggest improvement is reached when weight change period every 10 symbol. In this final project the RLS algorithm convergent at 10th iteration.

For SNR is 15 dB, equalizer input has value of ISI 67 %. After pass equalization process value of ISI decrease become 38 %. The value of BER for QPSK demodulator without equalizer is $1,5 \times 10^{-1}$, if QPSK demodulator is set adaptive equalizer value of BER decrease become 6×10^{-3} .