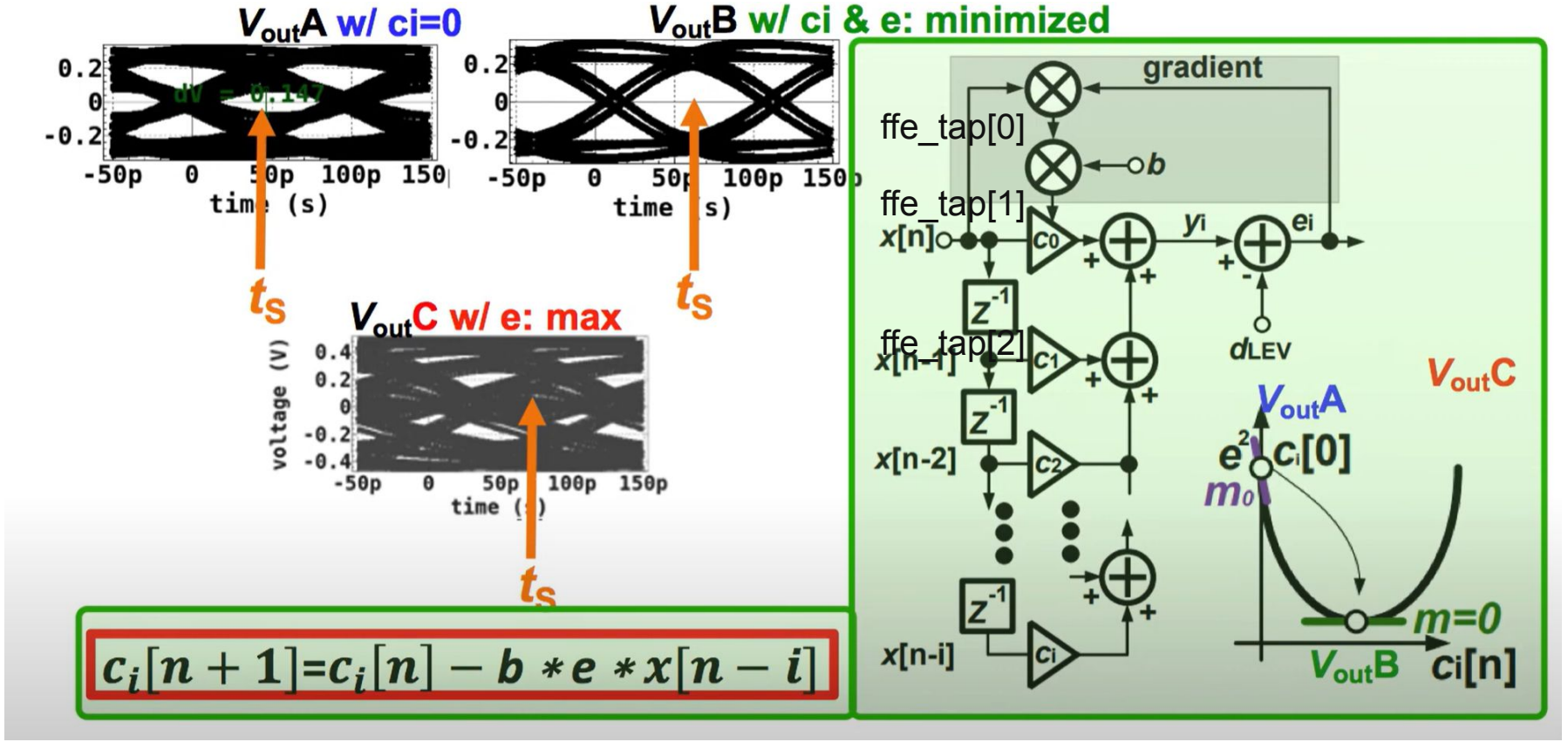
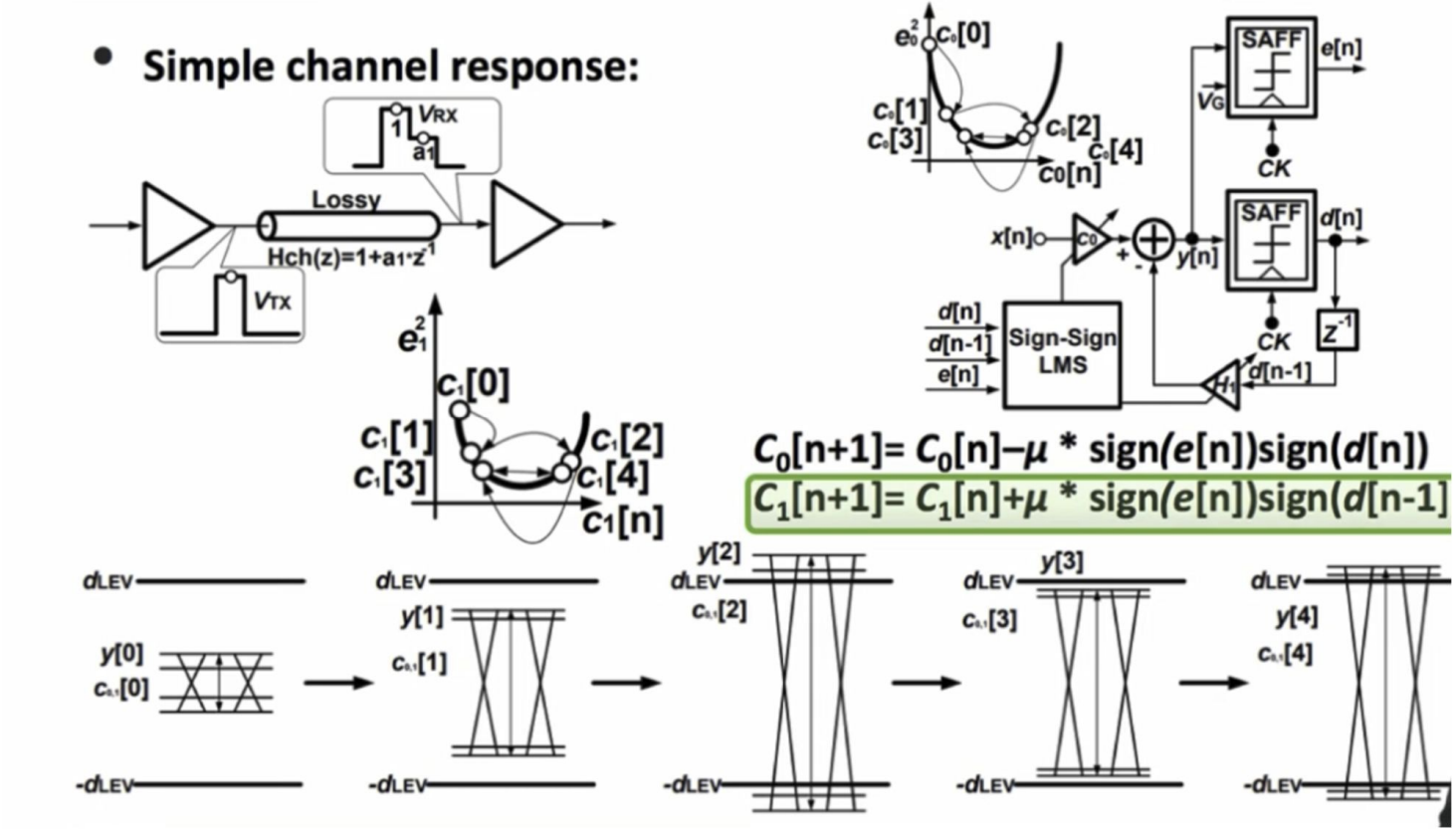
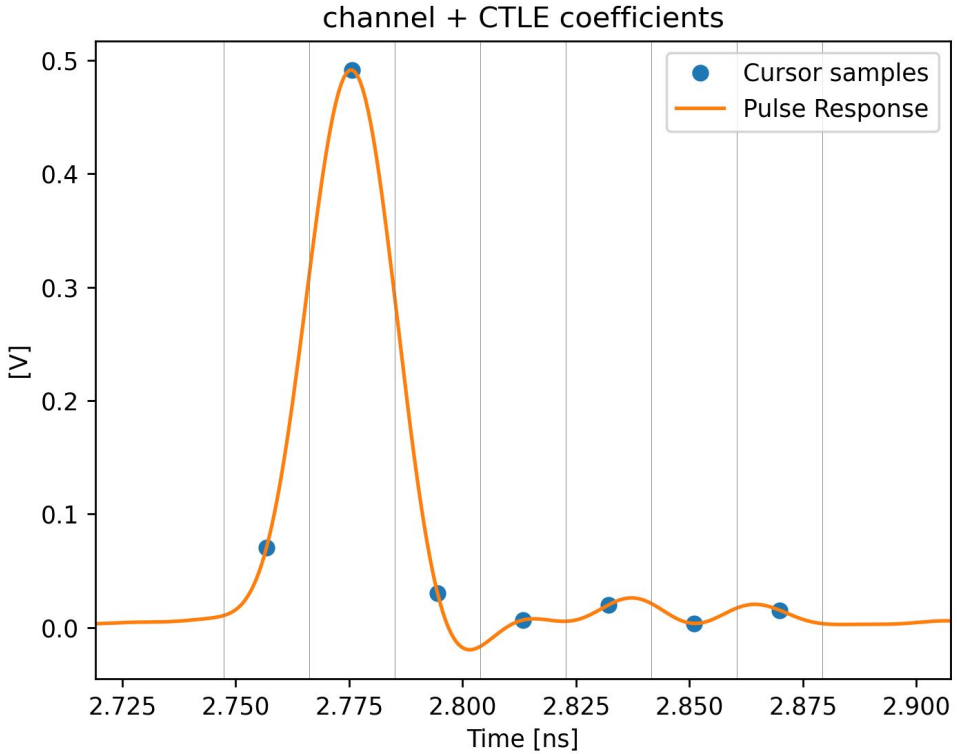
FFE with LMS



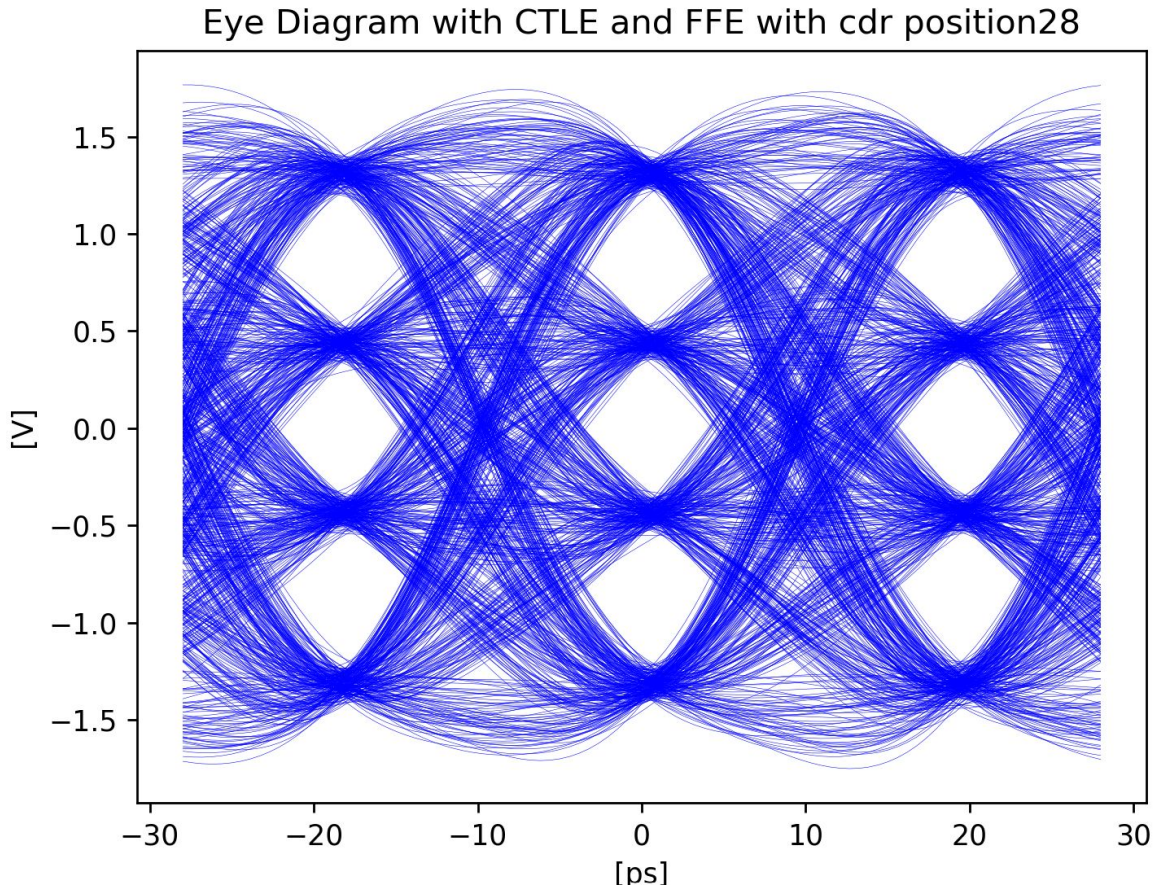
Sign-sign LMS DFE with dLev Adaptation (1)



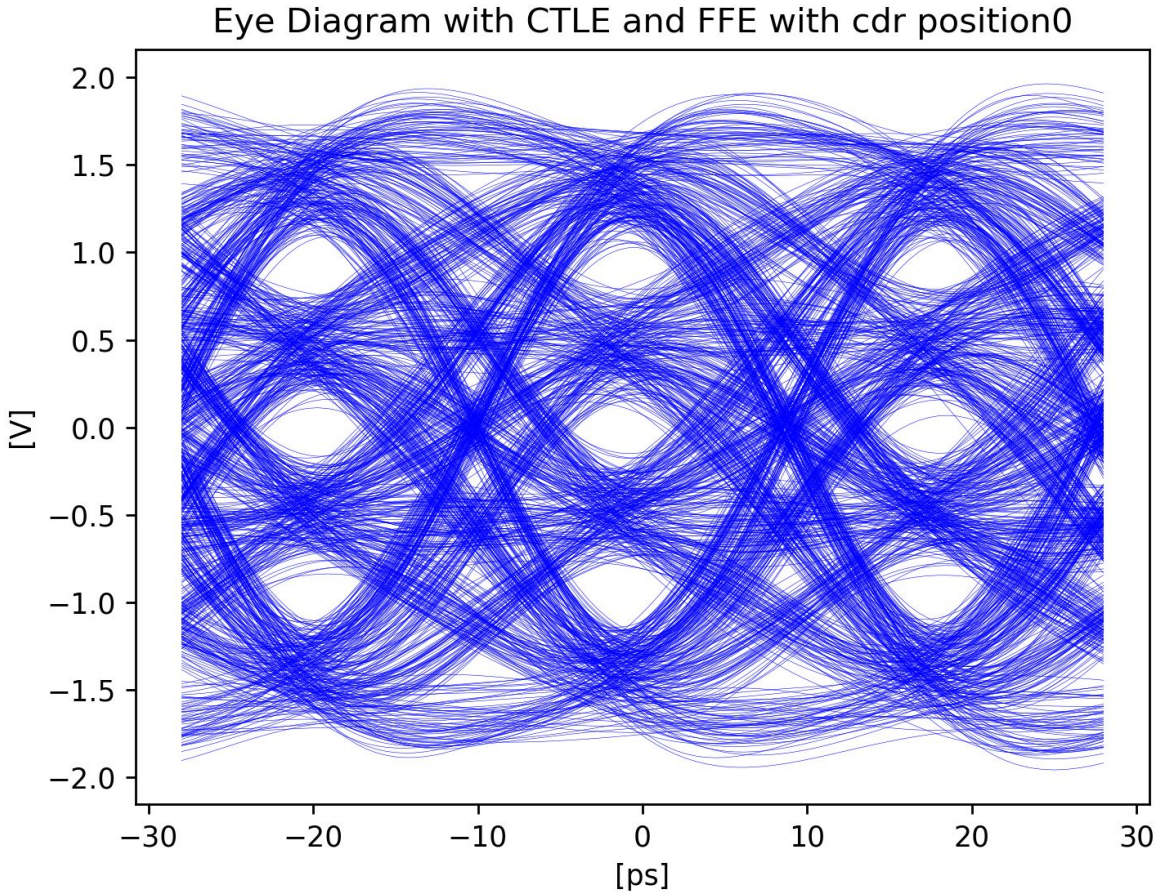
Impulse Response



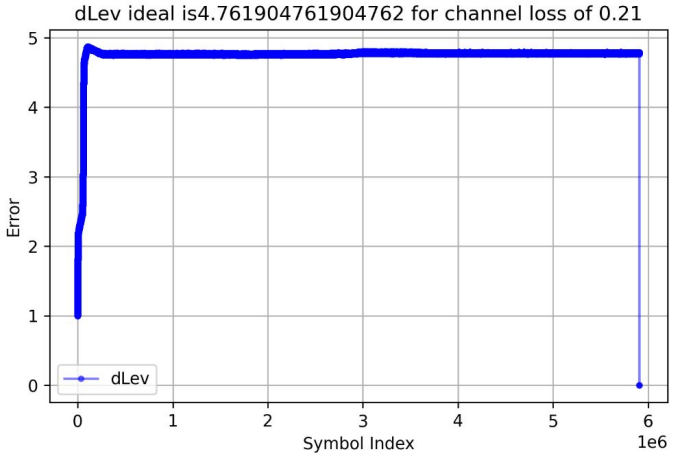
FFE+CDR

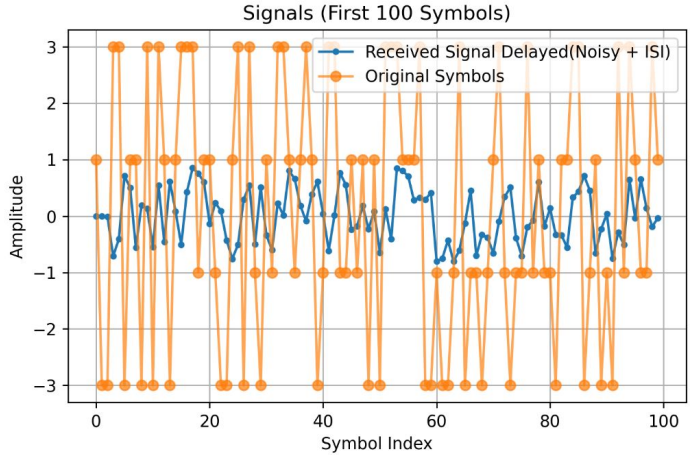


FFE+CDR

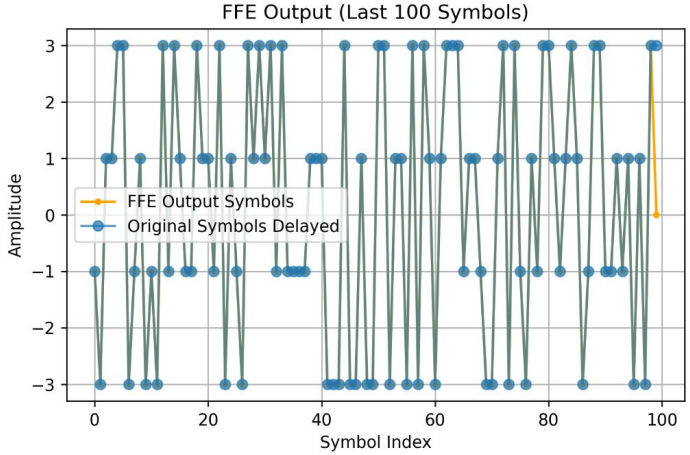


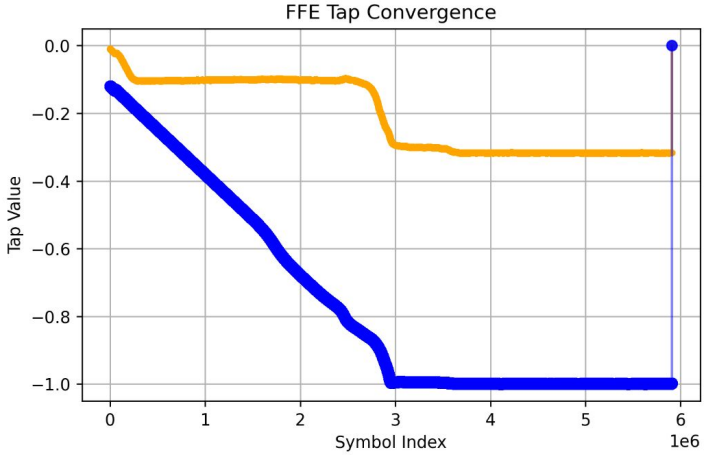
Sign-sign LMS FFE with dLev Adaptation (3)





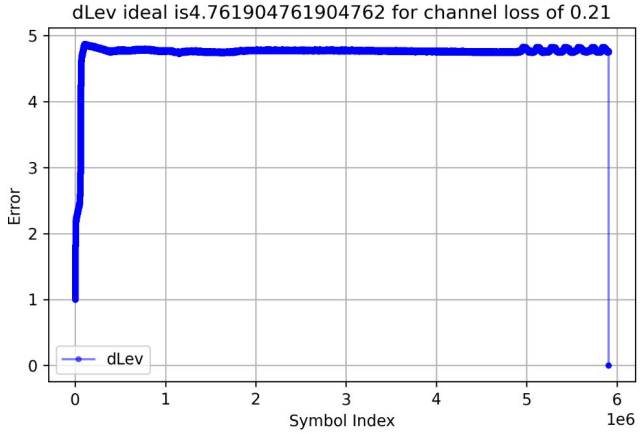
flip_next_data

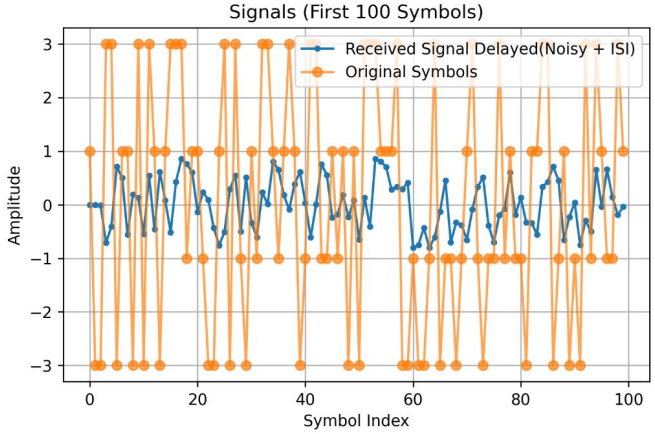


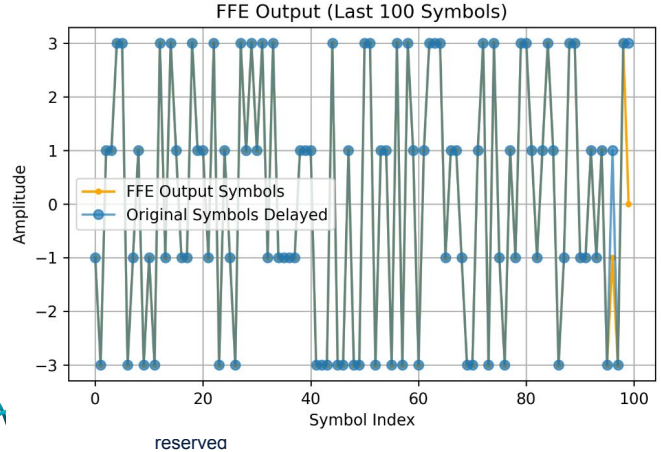


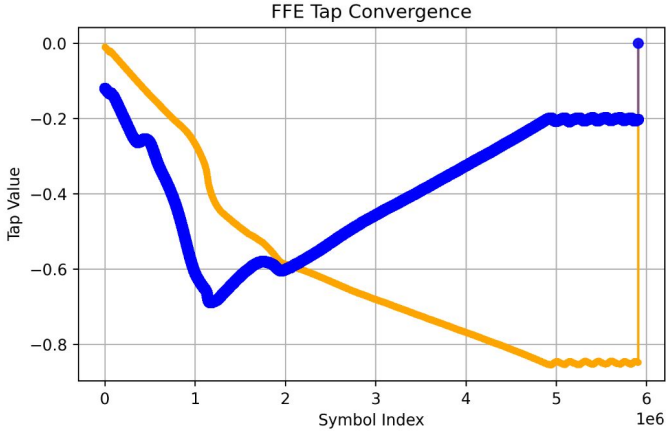
Sign-sign LMS FFE with dLev Adaptation (4)

next_data



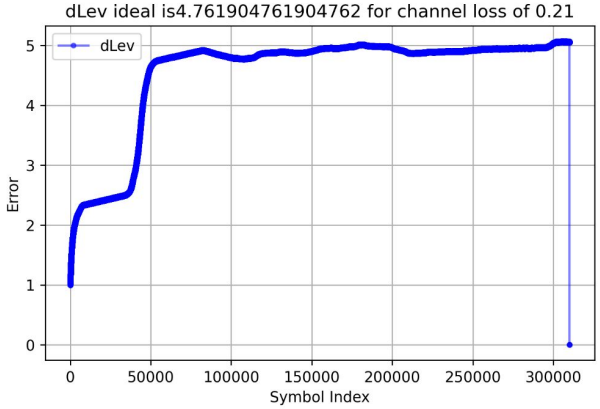


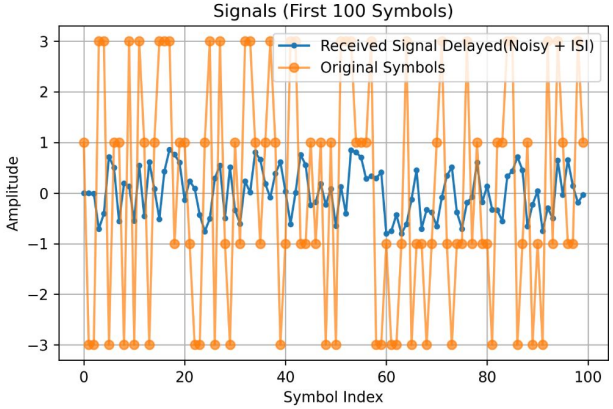


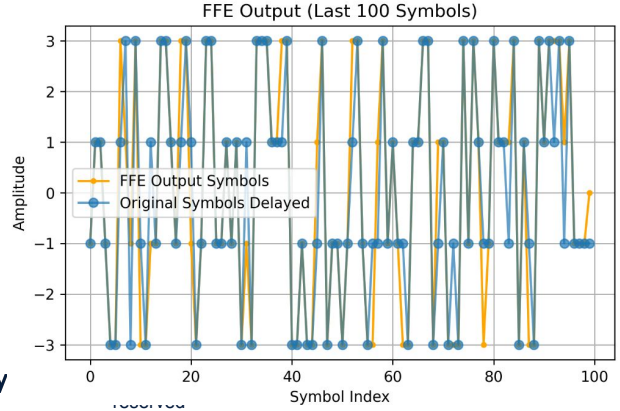


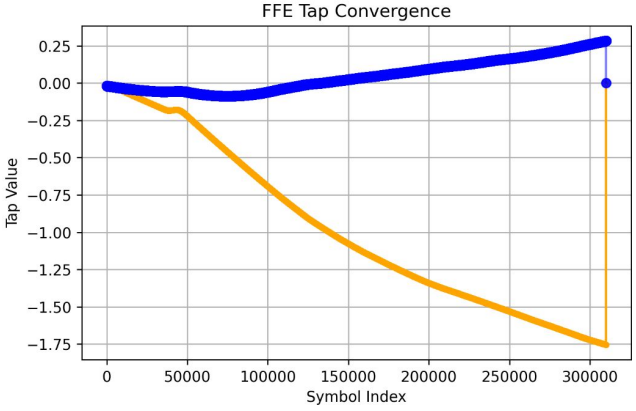
split_error

next_data



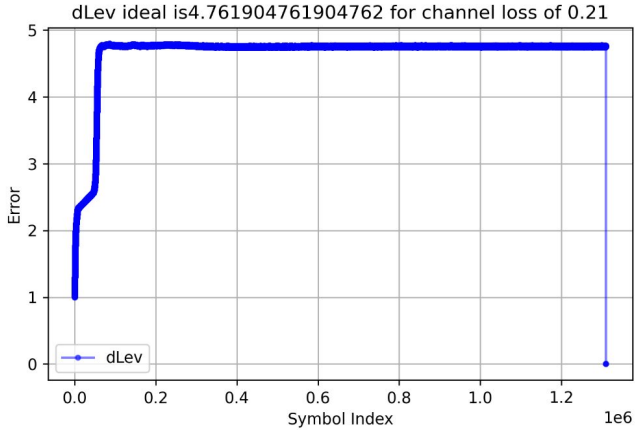


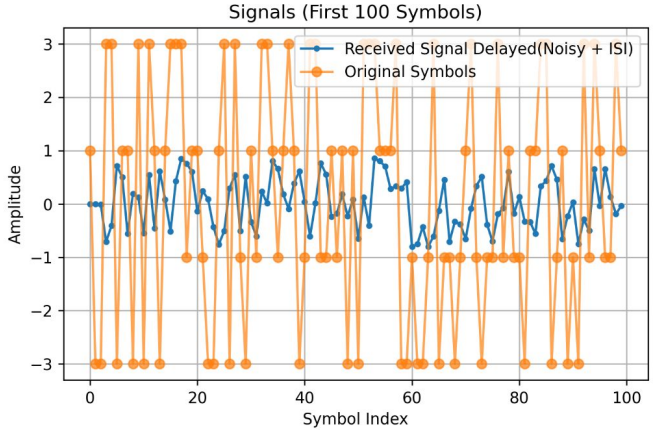


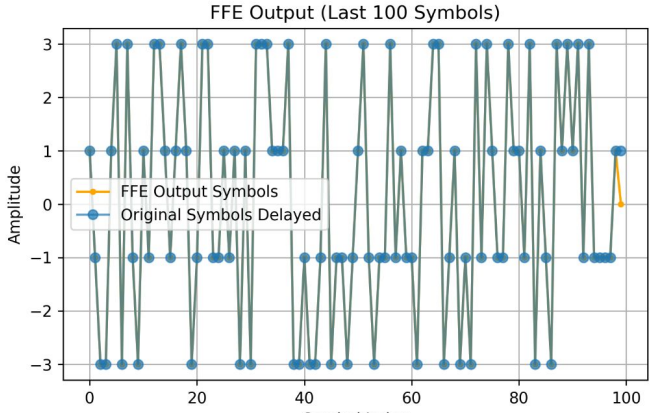


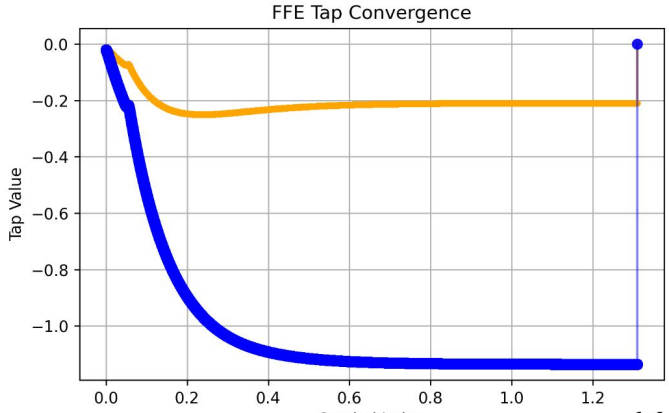
Split_error

flip_next_data



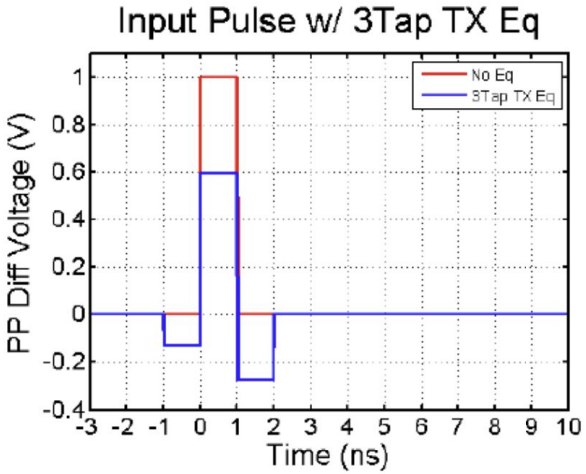


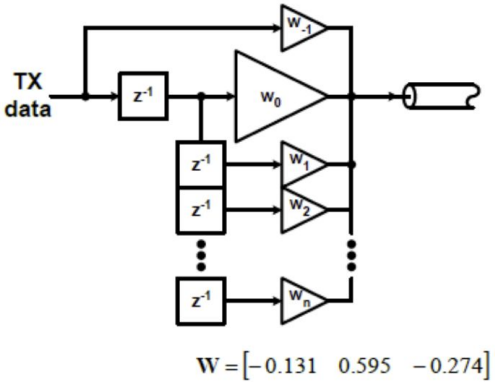




Transmitter FFE

Have access to data before ISI





$$\mathbf{W} = [-0.131 \quad 0.595 \quad -0.274]$$

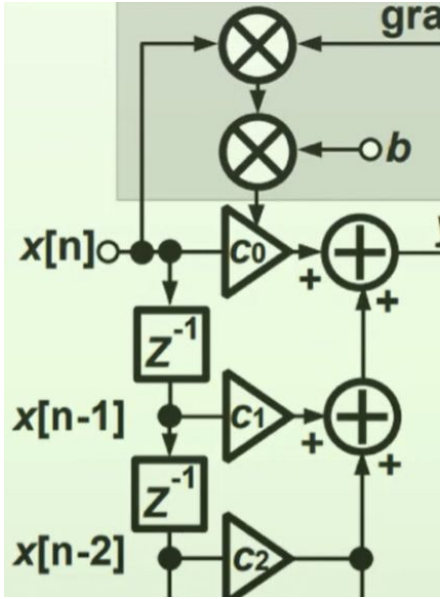
Receiver FFE

Received data already have ISI

y0= h0*c0+0 +0

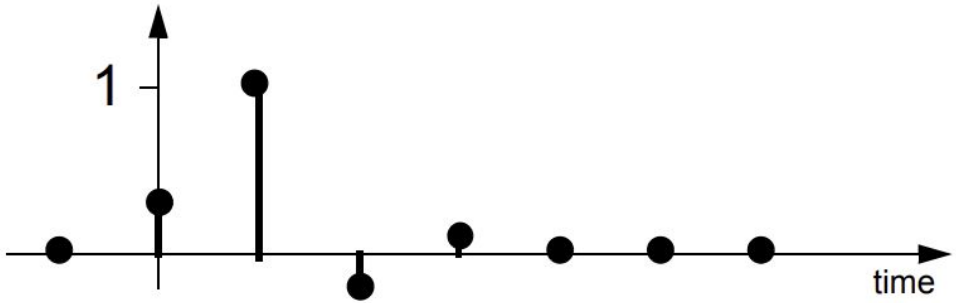
y1= h-1*c0+h-2*c1*0

y2= h0*c0+ h-1*c1+h-2*c2



Receiver FFE

- Suppose channel, $H_{tc}(z)$, has impulse response 0.3, 1.0, -0.2, 0.1, 0.0, 0.0



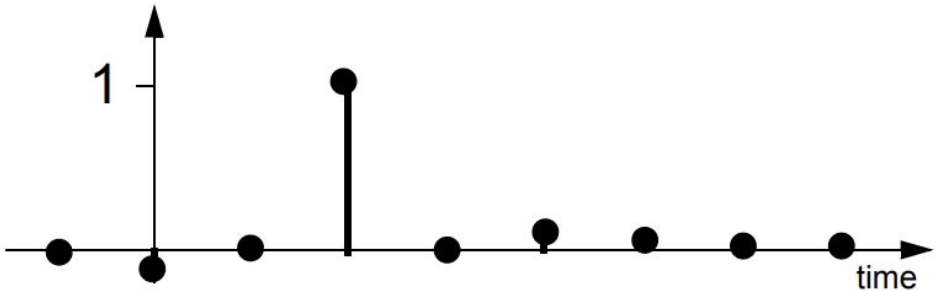
- If FFE is a 3-tap FIR filter with

$$y(n) = p_1 u(n) + p_2 u(n-1) + p_3 u(n-2)$$

Receiver FFE

$$
\begin{aligned}
y(1) &= 0 = 1.0p_1 + 0.3p_2 + 0.0p_3 \\
y(2) &= 1 = -0.2p_1 + 1.0p_2 + 0.3p_3 \\
y(3) &= 0 = 0.1p_1 + (-0.2)p_2 + 1.0p_3
\end{aligned} \tag{3}
$$

- Solving results in $p_1 = -0.266$, $p_2 = 0.886$, $p_3 = 0.204$
- Now the impulse response through both channel and equalizer is: 0.0, -0.08, 0.0, 1.0, 0.0, 0.05, 0.02, ...



Receiver FFE