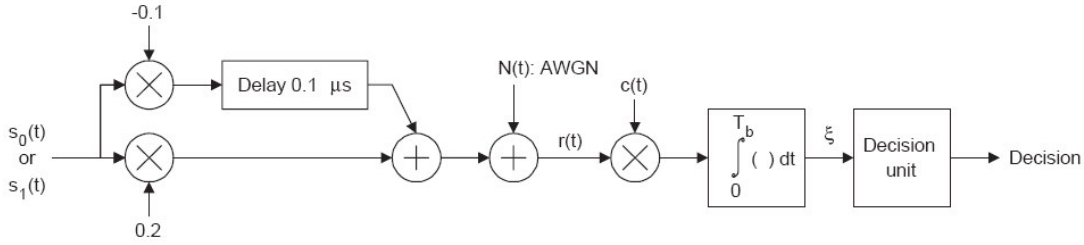
Consider the inter-carrier interference in OFDM that produces power leaking in the subcarriers

a) If we want to detect subcarrier i = 0, i.e. we sample the carrier at $x = x_0$. Find the signal to interference ratio (SIR) assuming only this interference and draw the SIR.

b) Consider ICI due to the following subcarriers

- $\Delta 1 = 0.1$,
- $\Delta 1 = \Delta 2 = 0.1$,
- $\Delta 1 = \Delta 2 = \Delta 3 = 0.1$,
- $\Delta 1 = 0$ and $\Delta 2 = \Delta 3 = 0.1$.

Assume, that all other sub-carriers do not interfere, e.g. by having a zero frequency offset. Calculate the resulting SIRs and comment on your results.



It is given that $s_0(t) = 0$ and that

$$s_1(t) = \begin{cases} A, & 0 \leq t \leq 10^{-6}[s] \\ 0, & \text{otherwise} \end{cases}$$

Assume that the bit rate is 100 kbps.

Find the maximum rate for which ISI = 0 using the ML receiver.

Find $c(t)$, and the decision threshold for the ML receiver.