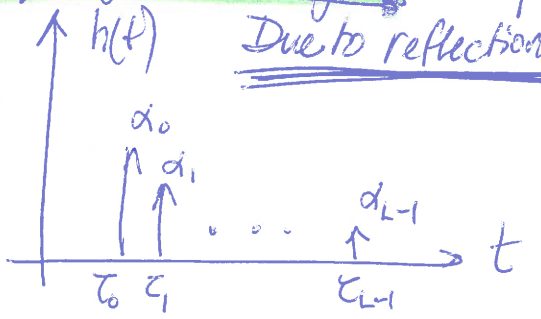
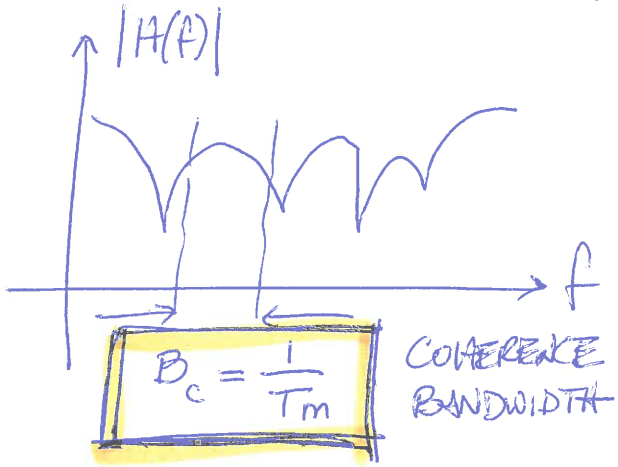
Frequency selectivity

L-path wireless channel

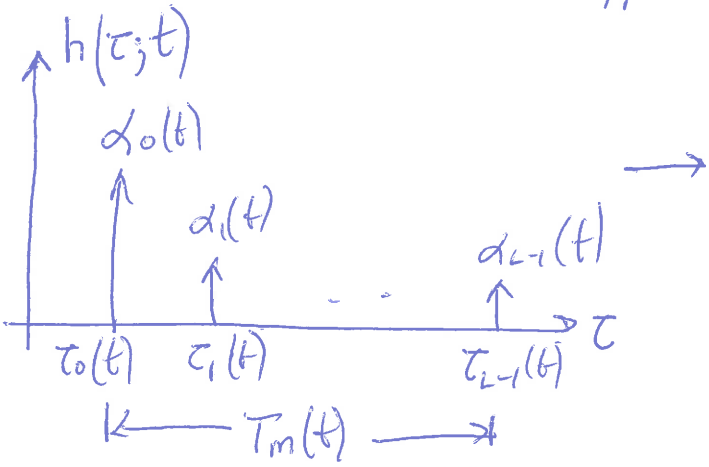
Due to reflections

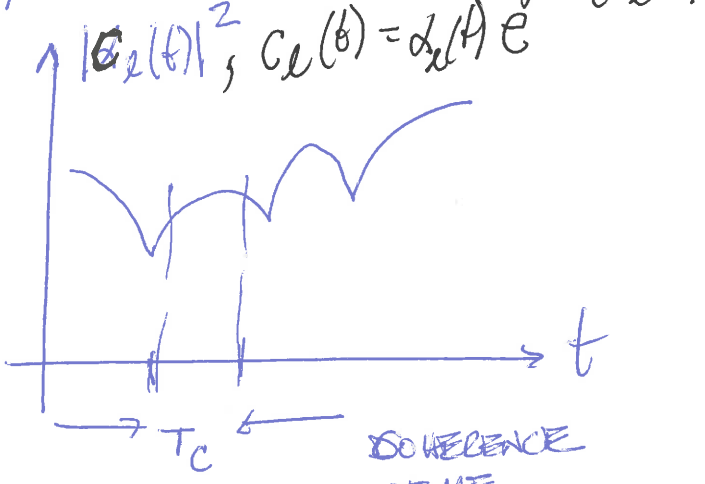




Time selectivity

Due to movement, Doppler effect





$$T_c = \frac{1}{B_D}$$

"Jake's" model for simulations

Moment resolve phase ambiguity

B_D : Doppler bandwidth

$$B_d = 2|f_m|$$

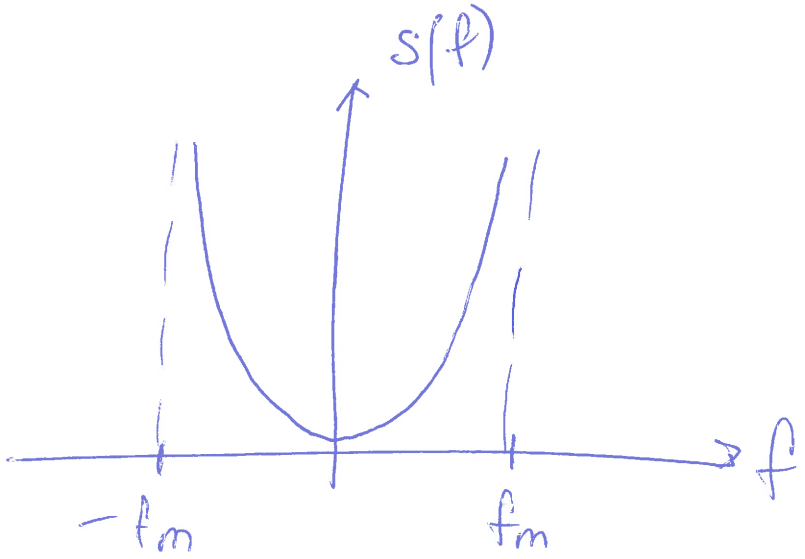
$$|f_m| = \frac{v}{\lambda}$$ Max. Doppler shift

$$\lambda = \frac{c}{f_c}$$, f_c: center frequency

$$= 2\frac{v}{\lambda} = 2\frac{f_c v}{c} \rightarrow$$

$$T_c = \frac{c}{2 f_c} \frac{1}{v}$$

PSD of Doppler faded channel:



$$S(f) = \begin{cases} \dfrac{1}{\pi f_m \sqrt{1-(f/f_m)^2}}, & |f| < f_m \\ 0, & \text{o.w.} \end{cases}$$