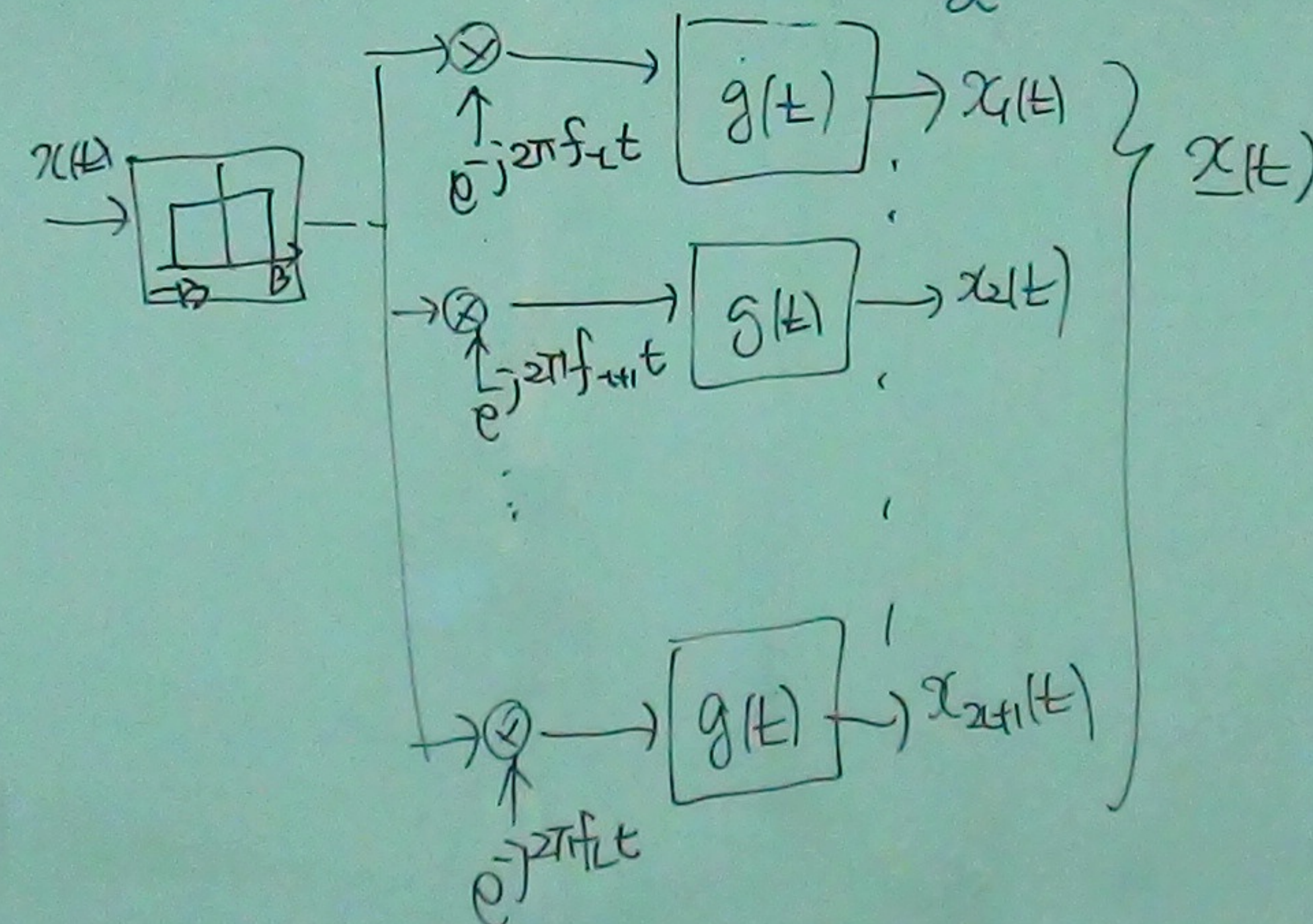
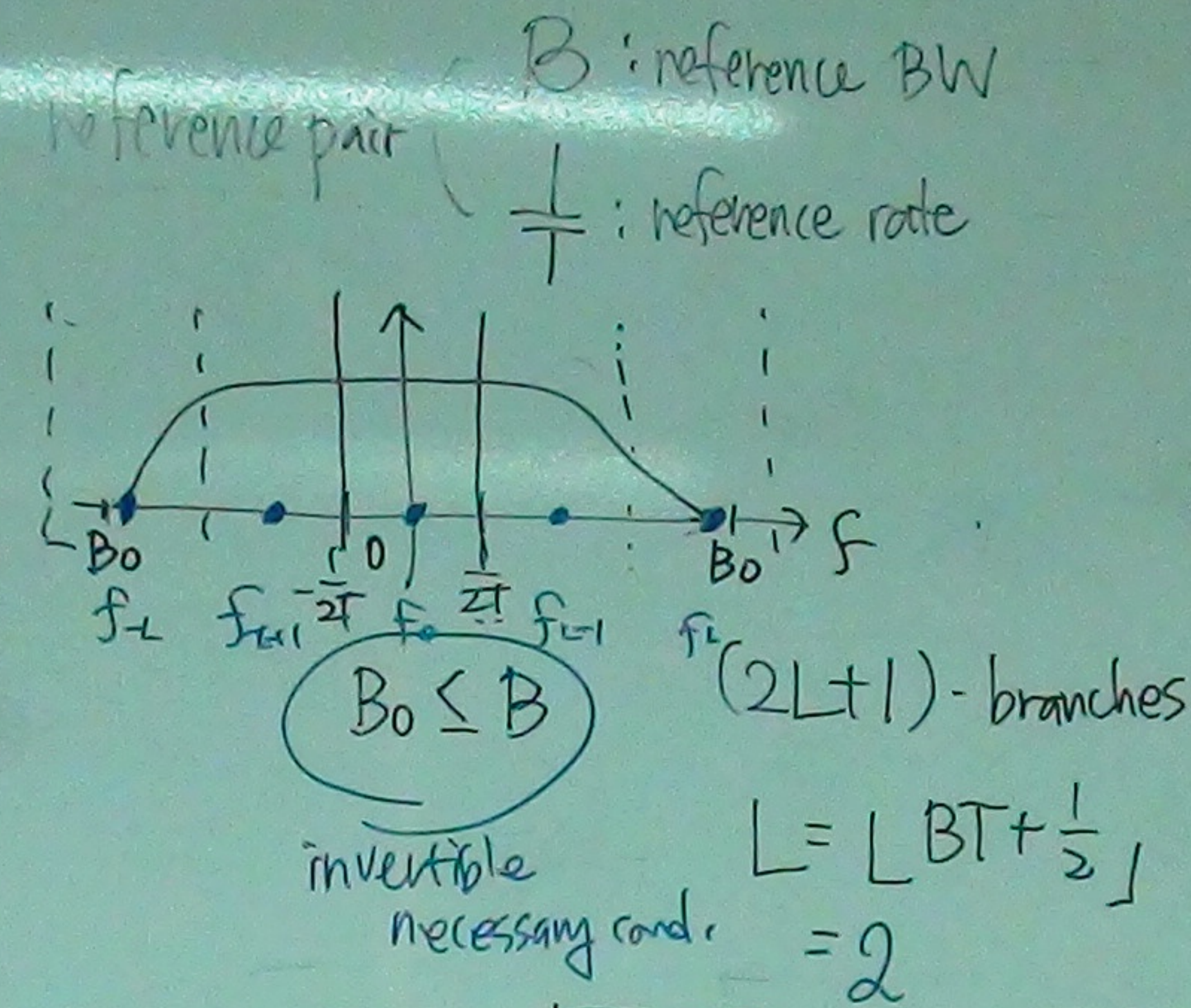
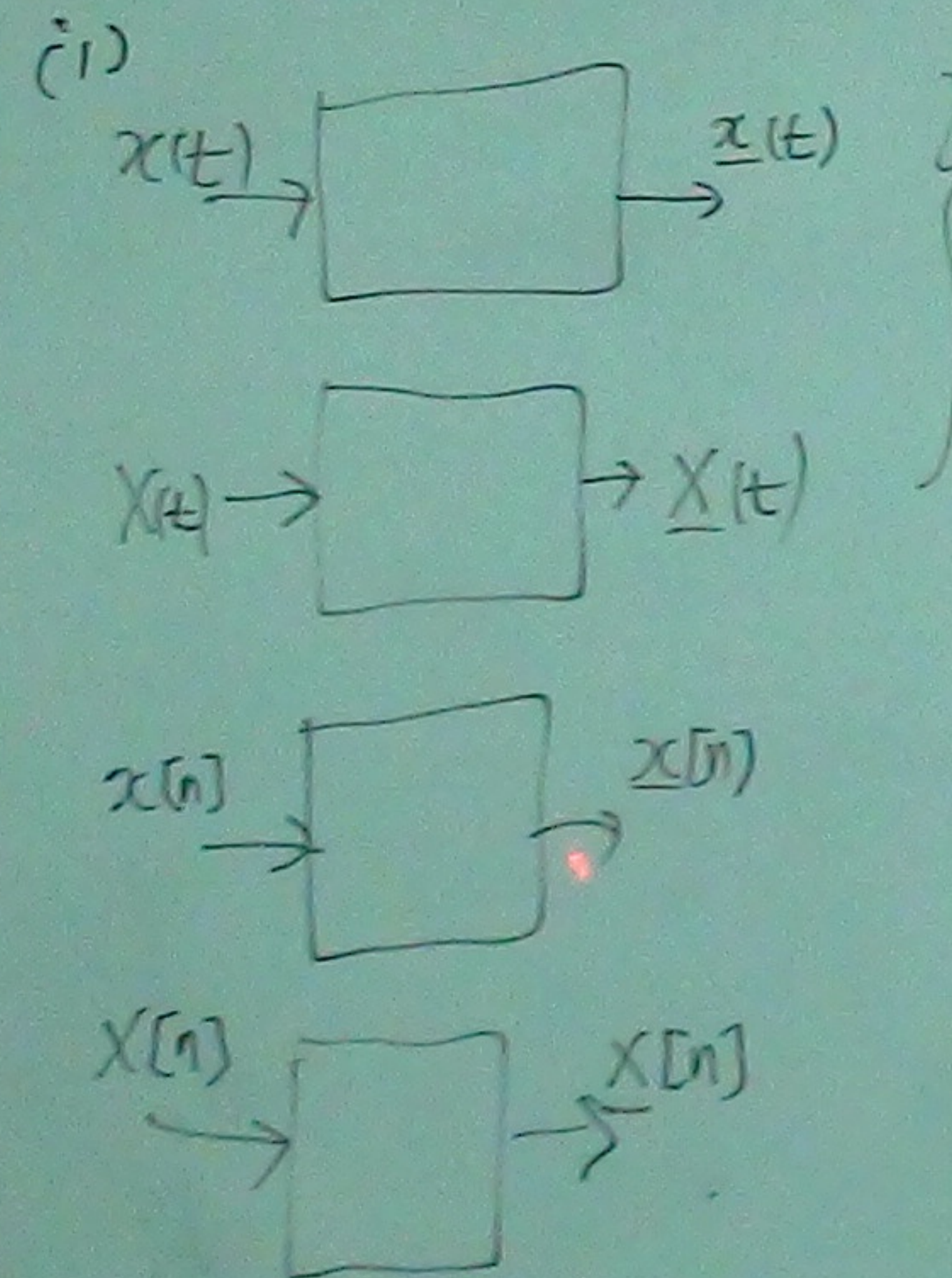
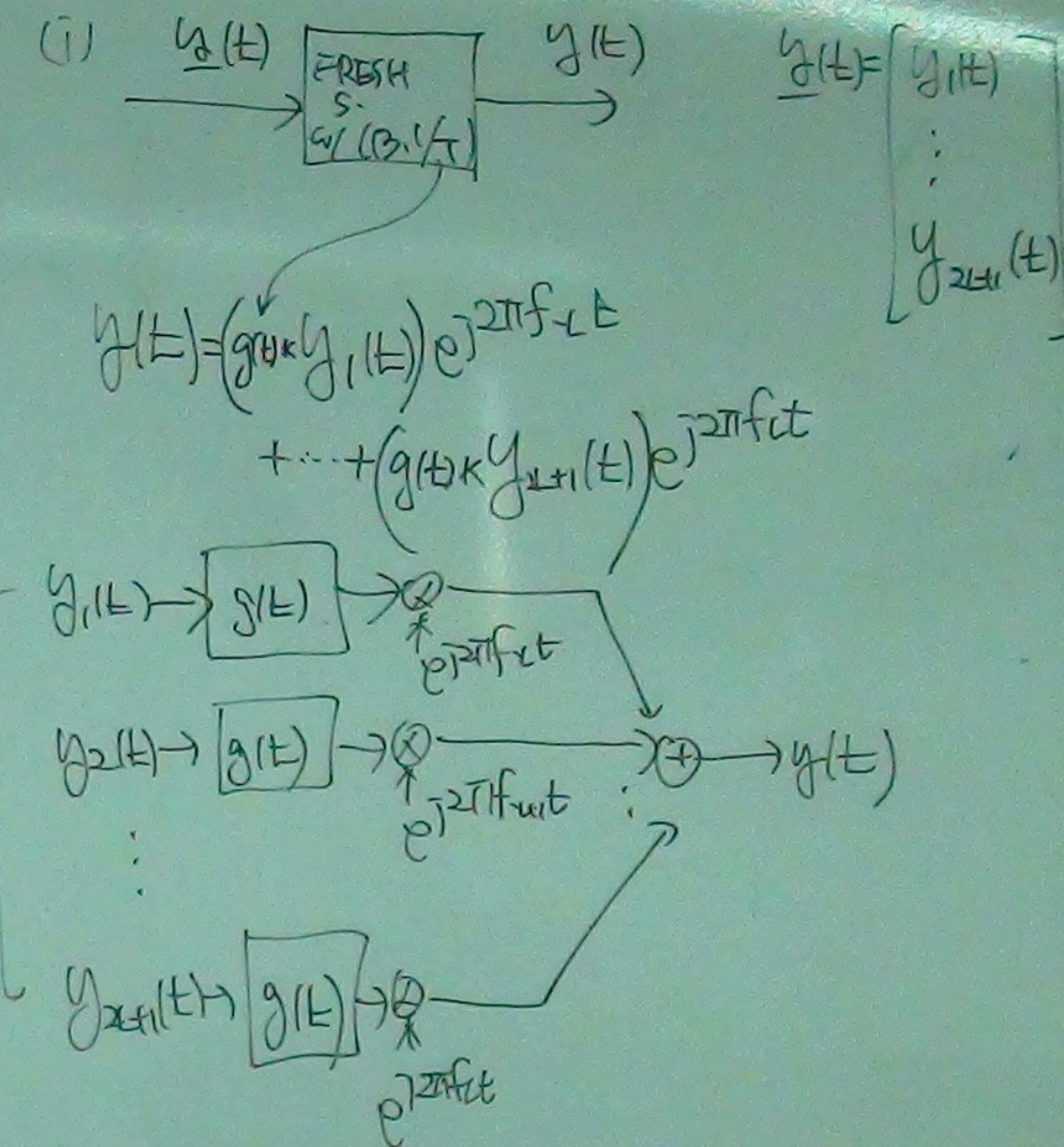


□ FRESH vectorizer

cf) $\text{vec}(\mathbf{H}) = \begin{bmatrix} h_1 \\ h_2 \\ \vdots \\ h_{N_t} \end{bmatrix} = \underline{h}$
 → vectorization
 $\text{mat}(\underline{h}) = \mathbf{H}$
 → matricization
 → matricizer

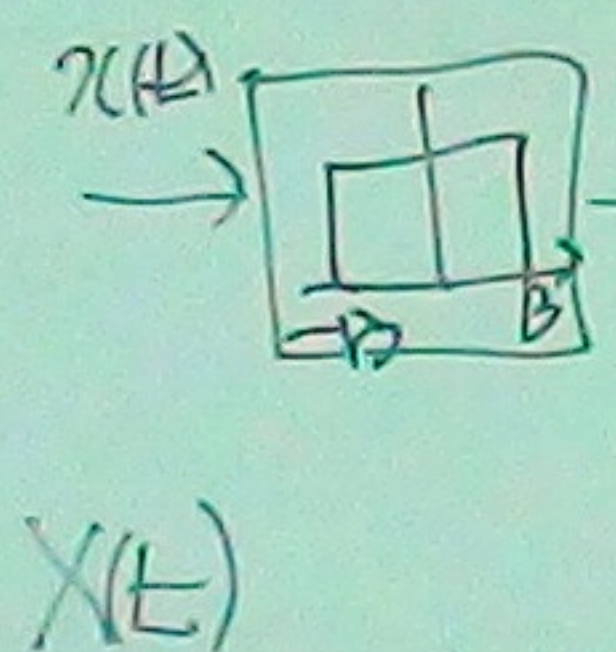
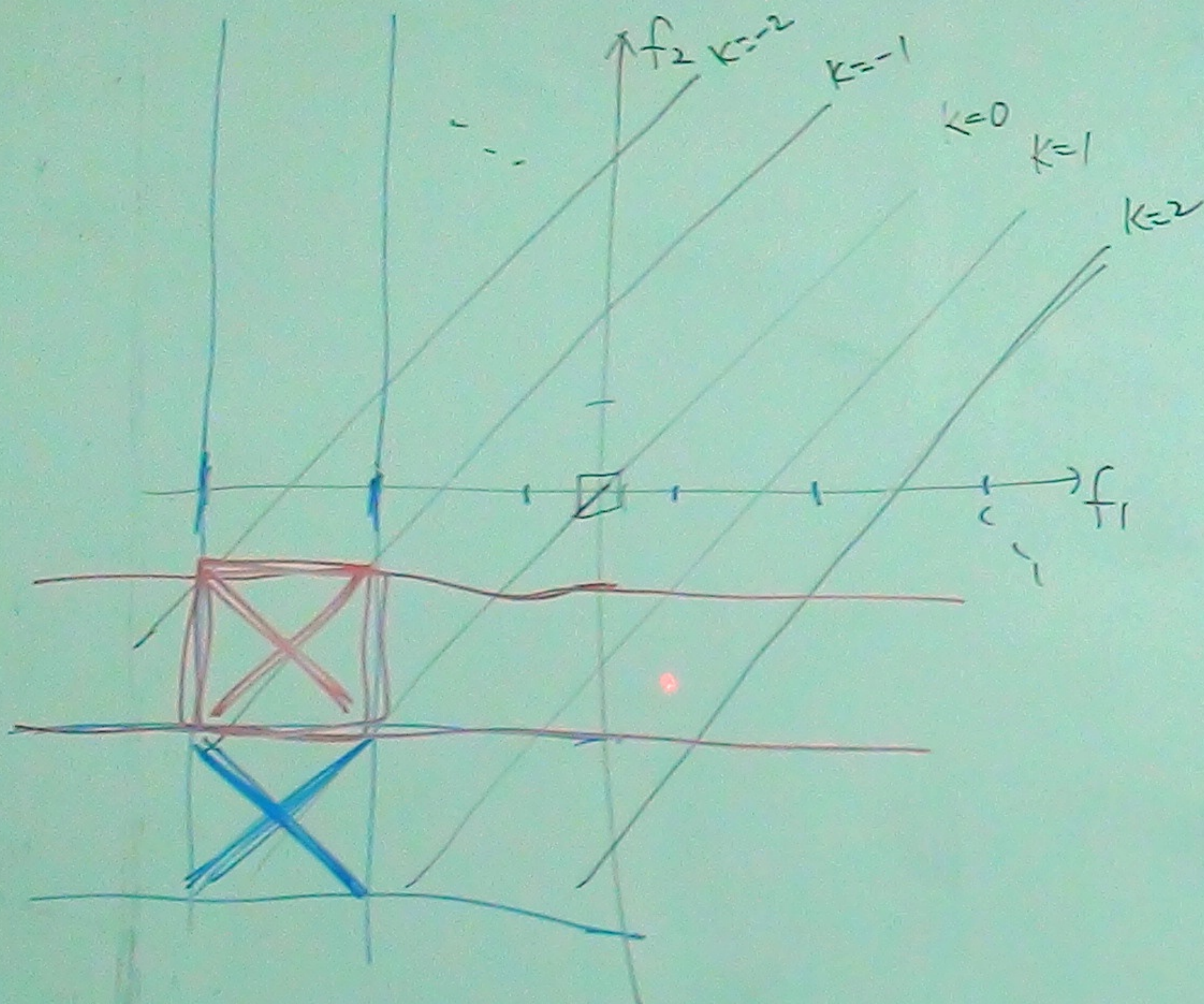


□ FRESH scalarizer



□ FRESH vectorizer

(i) $X(t)$ SOS w/ period $T_0 = T$
 bandlimited to $B_0 \leq B$
 $\Leftrightarrow \begin{cases} S_{xx}(f_1, f_2) = G_{T_0}(f_1) S_{xx}(f_1, f_2) G_{T_0}^*(f_2) \\ \tilde{S}_{xx}(f_1, f_2) = G_{T_0}(f_1) \tilde{S}_{xx}(f_1, f_2) G_{T_0}(f_2) \end{cases}$

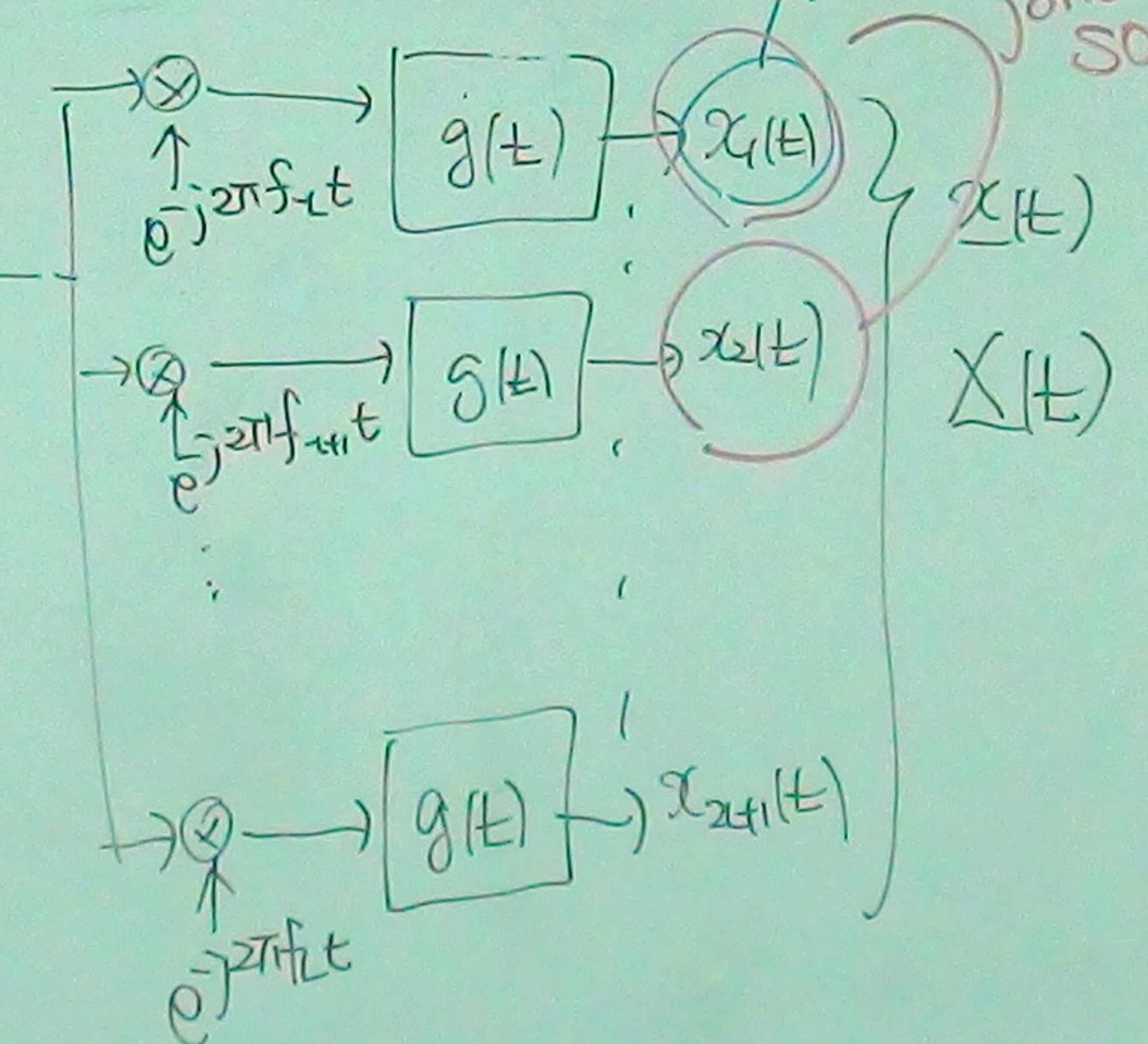


B : reference BW
 $\frac{1}{T}$: reference rate

$$\therefore S_{xx}(f_1, f_2) = \begin{bmatrix} \times & \times & \times & \times & \times \\ \times & \times & \times & \times & \times \\ \times & \times & \times & \times & \times \\ \times & \times & \times & \times & \times \\ \times & \times & \times & \times & \times \end{bmatrix} \quad (2M+1) \times (2M+1)$$

$$R_{xx}(t_1, t_2) = R_{xx}(t, t_2)$$

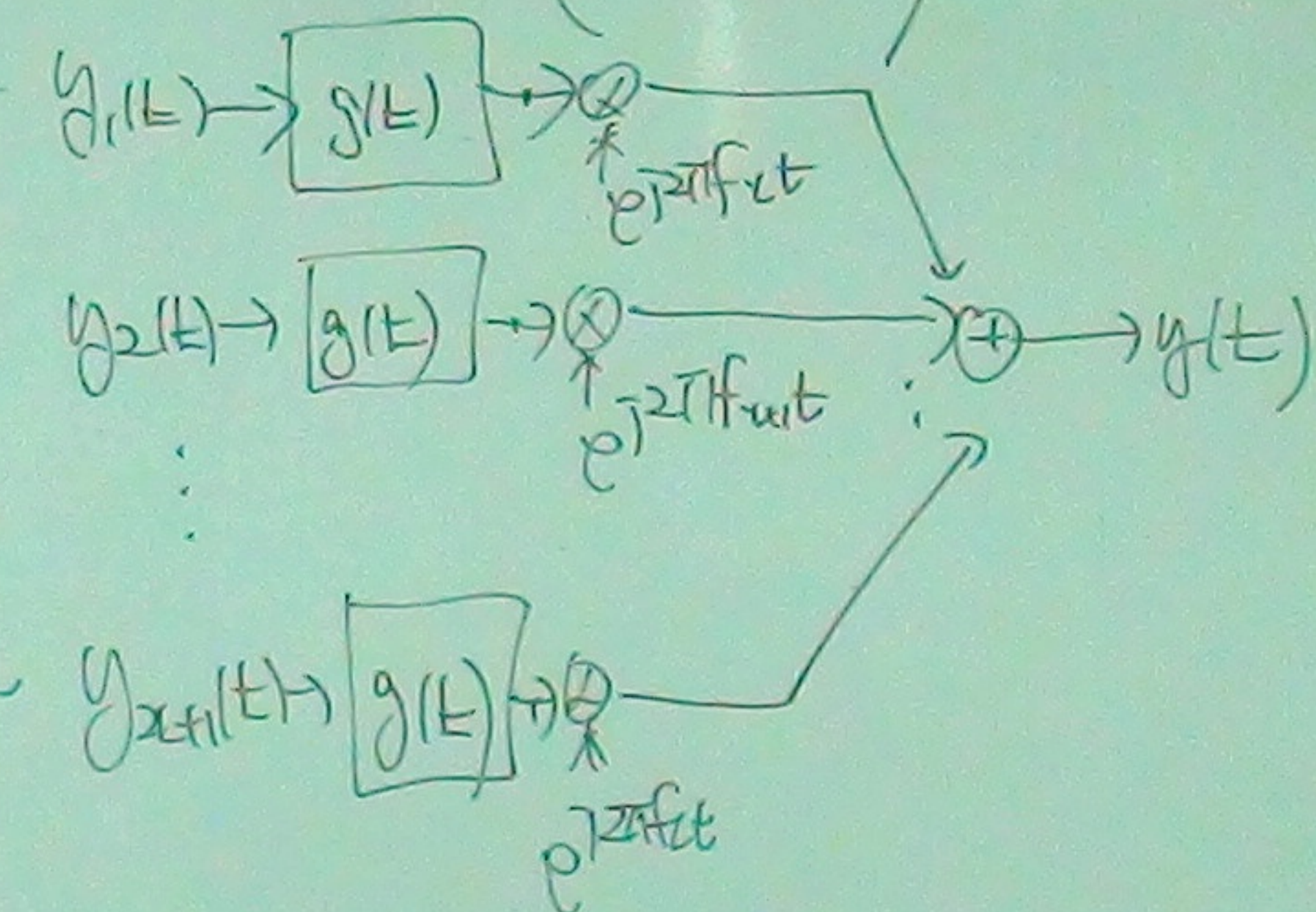
WSS SOS



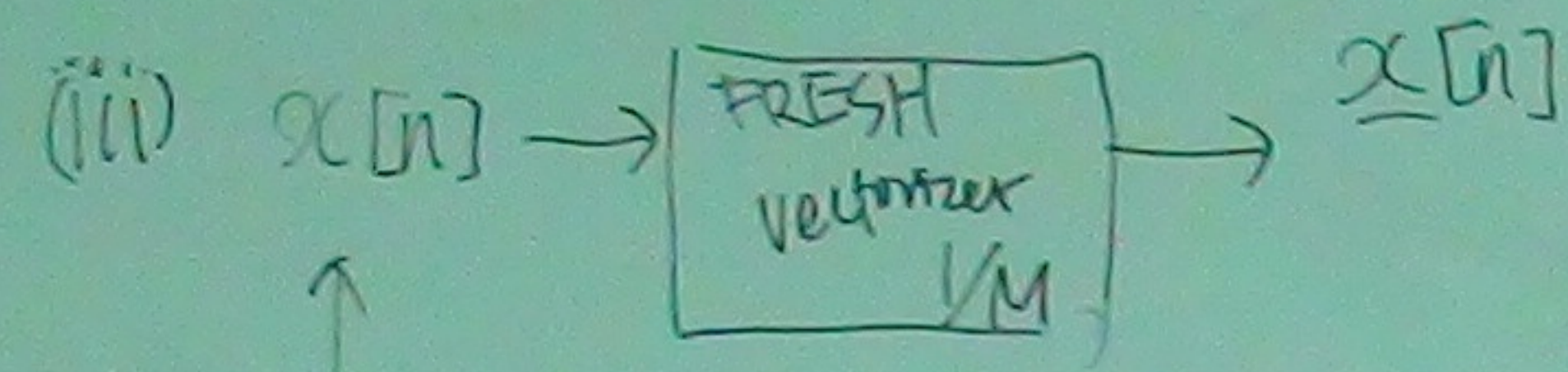
□ FRESH scalarizer

(i) $y(t)$ FRESH $S_{yy}(B, 1/T)$ $y(t) = \begin{bmatrix} y_1(t) \\ \vdots \\ y_{2M+1}(t) \end{bmatrix}$

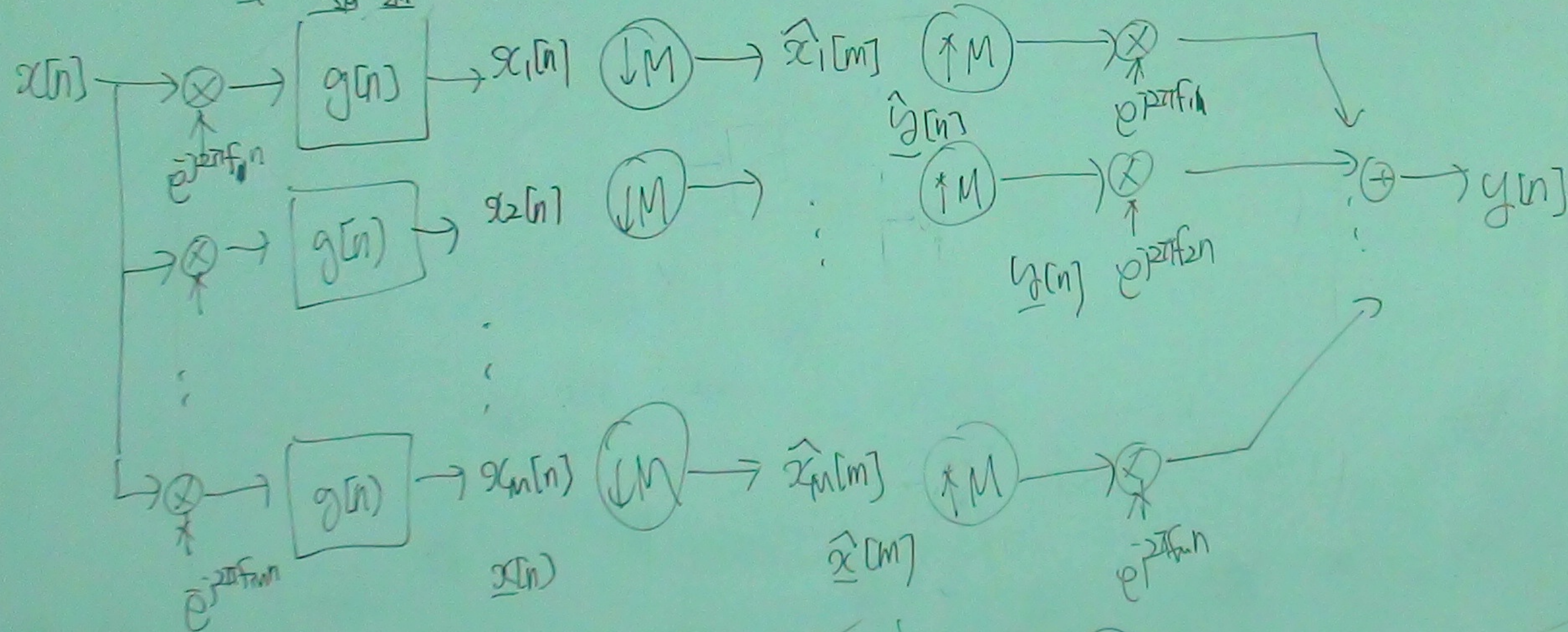
$$y(t) = (g_{1M} y_1(t) e^{j2\pi f_{-M} t} + \dots + (g_{1M} y_{2M+1}(t) e^{j2\pi f_{-M} t})$$



□ FRESH vectorizer



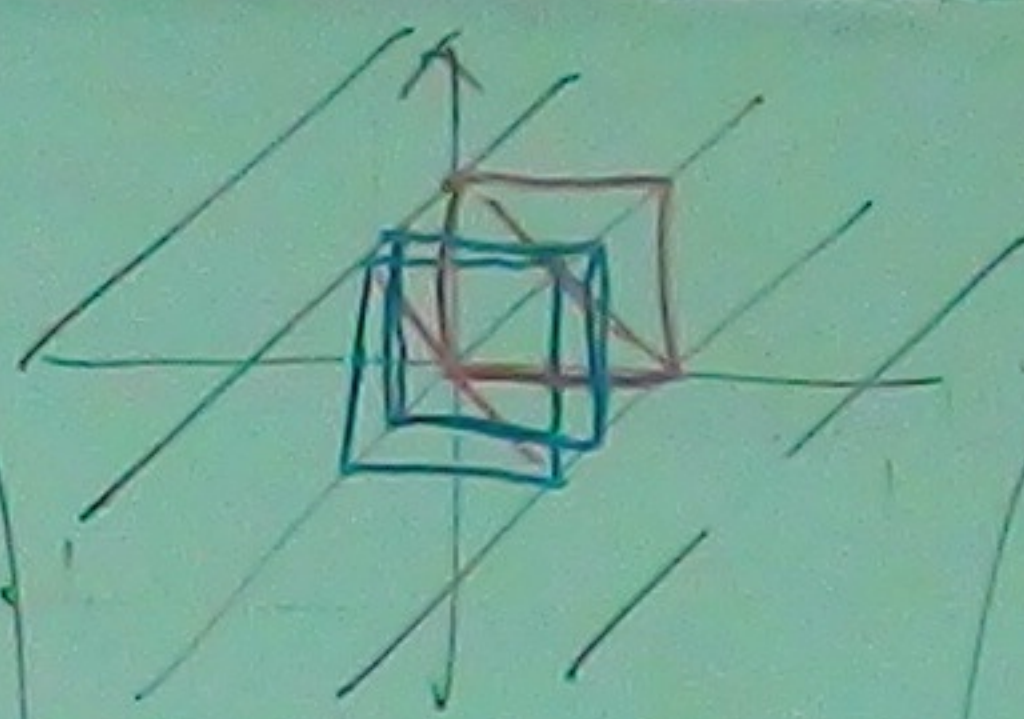
$X(e^{j2\pi f})$
 $= X(e^{j2\pi f_1}) \frac{1}{M} \dots \frac{1}{M} \dots \frac{1}{M}$
 (ex/ $M=7$)



analyzer

synthesizer

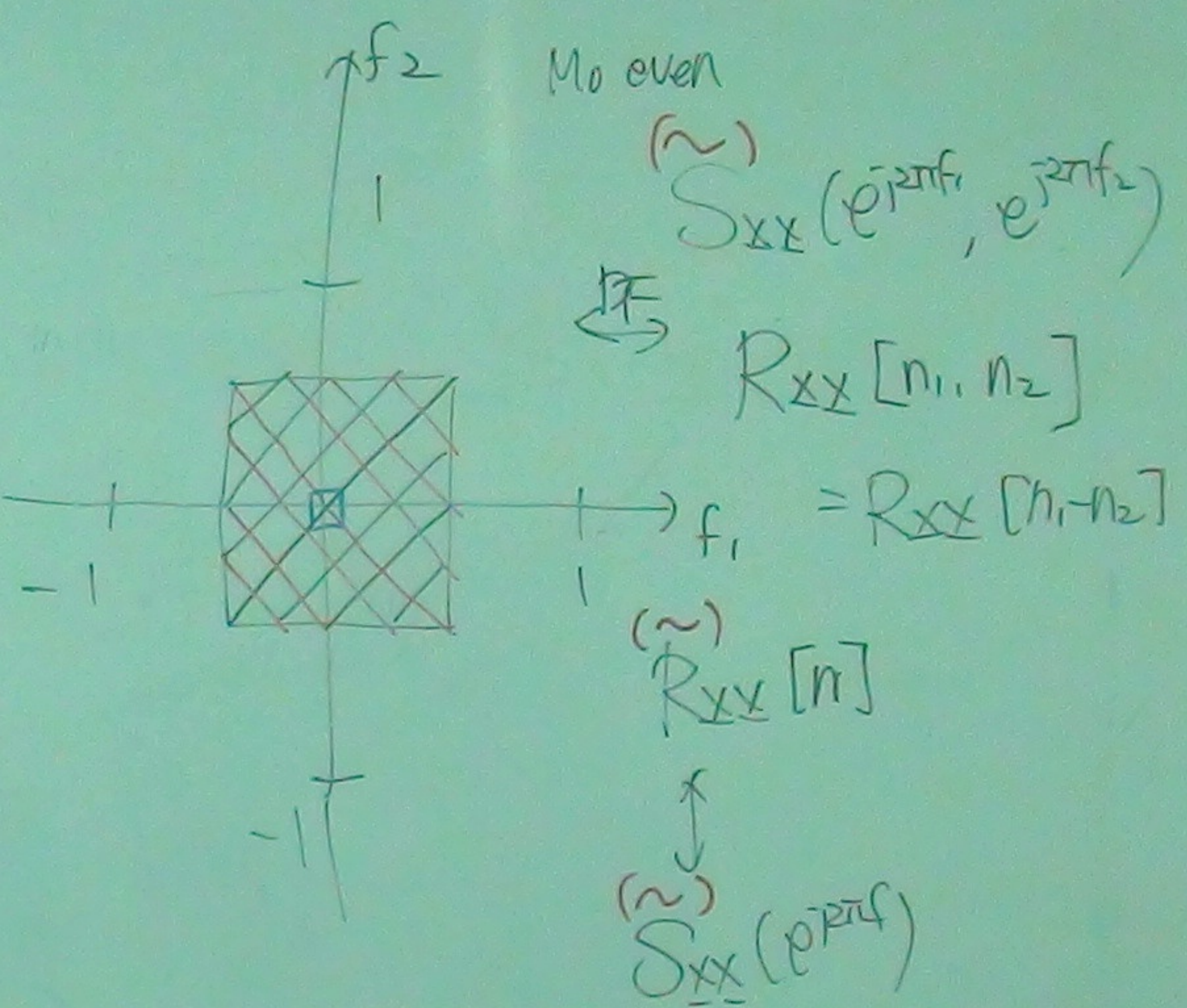
□ FRESH scalarizer



$(M) \times (N)$ SOCS w/ $M_0 = M$

$\left(\frac{1}{M} = \frac{1}{KM_0}, \forall K \in \mathbb{N} \right)$

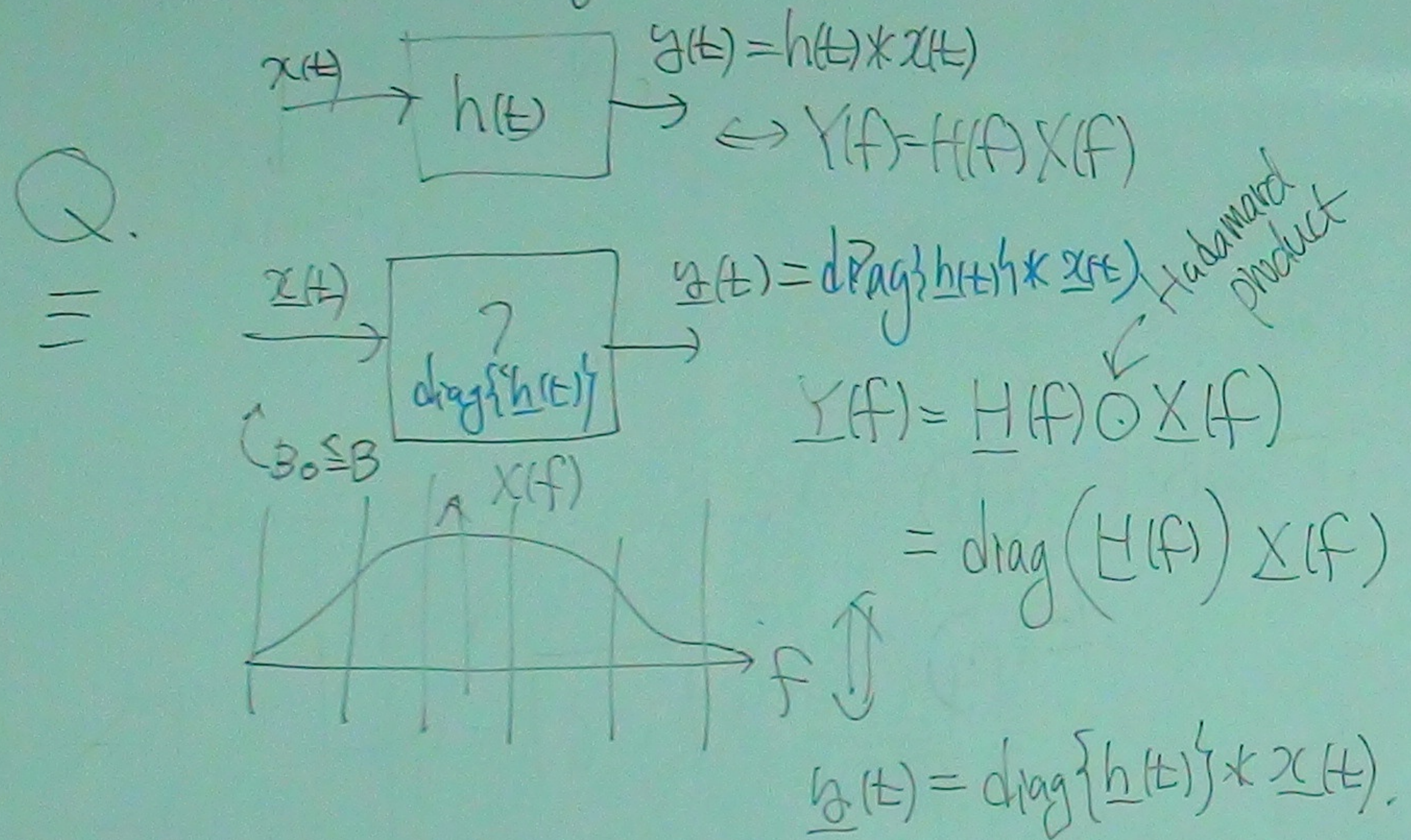
$\tilde{S}_{xx}(e^{j2\pi f_1}, e^{j2\pi f_2})$



vector SOS r.p. $\underline{x}[n]$
 $\underline{\hat{x}}[n]$



- LTI filtering



□ LPTV filtering

