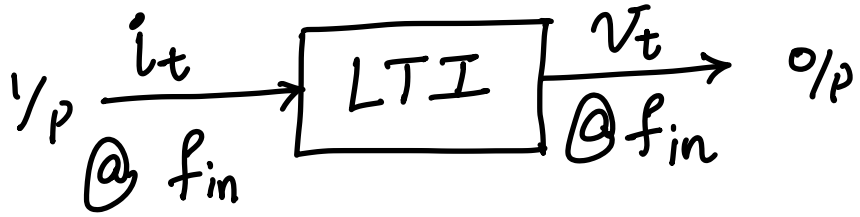
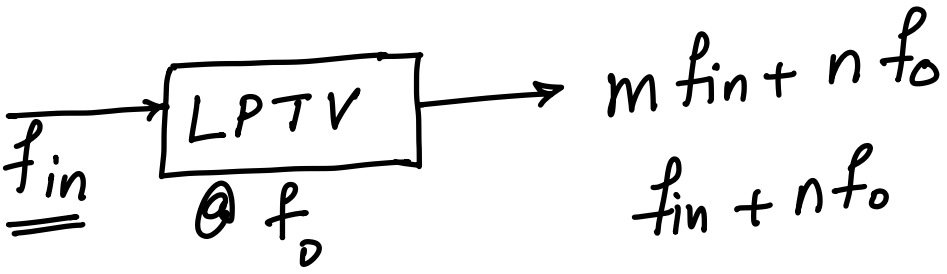
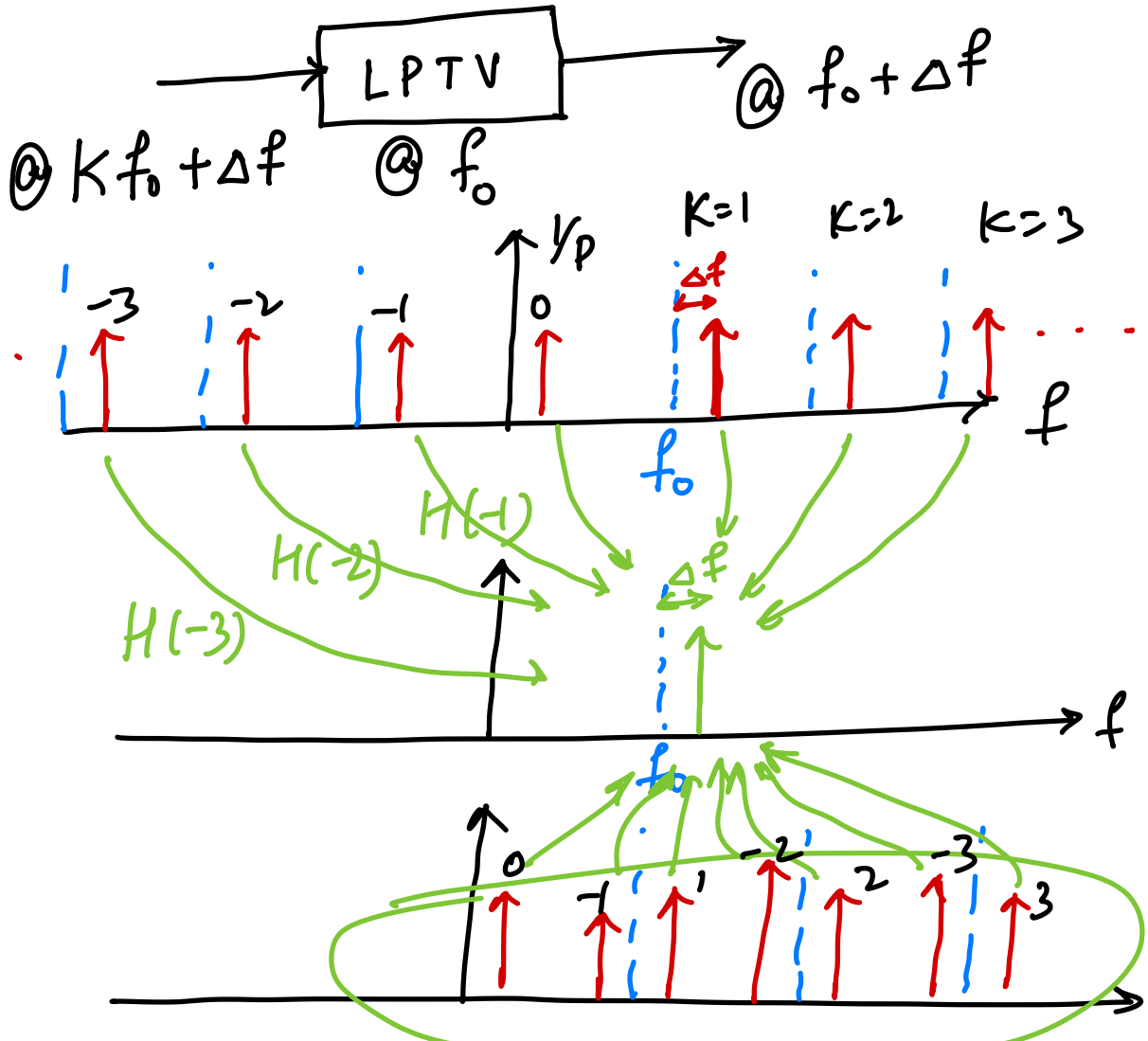
ISF & PPV simulation using PSS/PXF

PXF (Cadence) – LPTV systems







Indexing in Cadence

Input $\underbrace{K\omega_0 + \Delta\omega}$

$$\downarrow$$

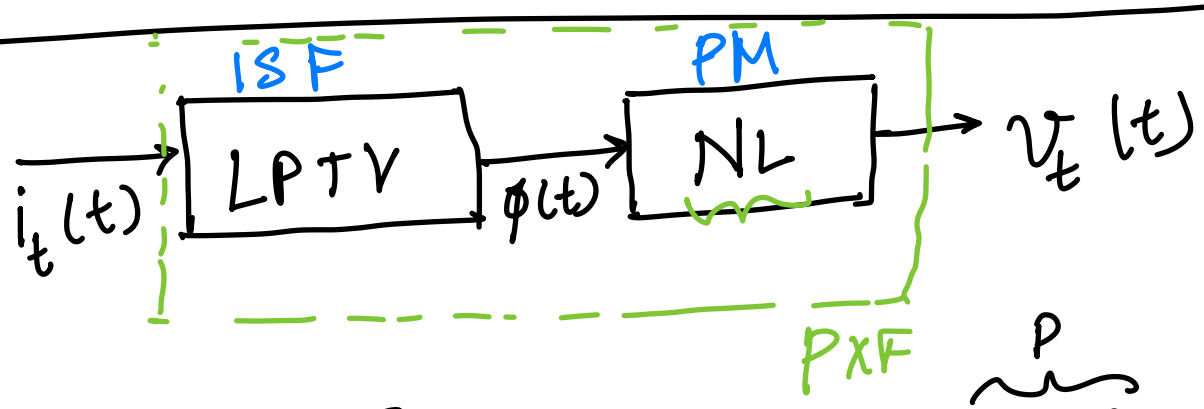
$$\underbrace{p\omega_0 + \underbrace{(\omega_0 + \Delta\omega)}_{\omega_{out}}}_{\omega_{in}}.$$

$$\Rightarrow \boxed{p = k - 1}$$

index in cadence

index in ISF.

ISF $\equiv$



$$i_t(t) = I_t \cos\left[(\omega_0 + \Delta\omega)t + \alpha_k + \underbrace{(k-1)}_{p}\omega_0 t\right]$$

$$\Gamma(t) = \frac{c_0}{2}\cos\theta_0 + \sum_{m=1}^{N} c_m \cos(m\omega_0 t + \theta_m)$$

$$\phi(t) = \frac{1}{q_{max}} \int_{-\infty}^{t} \Gamma(\tau)\, i_t(\tau)\, d\tau$$

$$\phi(t) \simeq \frac{I_t C_k}{2 q_{max} \Delta\omega} \sin\left(\Delta\omega t + \gamma_k - \theta_k\right)$$

$$v_t(t) = V_{H1} \cos\left(\omega_0 t + \theta + \phi(t)\right)$$

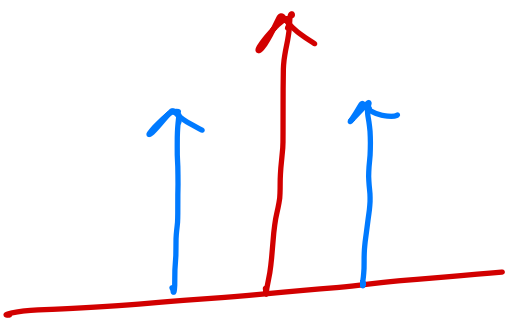
$$\simeq V_{H1} \cos(\omega_0 t + \theta)$$

$$+ \frac{V_{H1} I_t C_k}{4 q_{max} \Delta\omega} \cos\left[(\omega_0 + \Delta\omega)t + \gamma_k + \theta - \theta_k\right]$$

$$- \frac{V_{H1} I_t C_k}{4 q_{max} \Delta\omega} \cos\left[(\omega_0 - \Delta\omega)t - \gamma_k + \theta - \theta_k\right]$$

$$|H(k-1)| = \frac{V_{H1} C_k}{4 q_{max} \Delta\omega}$$

$$\angle H(k-1) = \theta - \theta_k$$



$$C_k = \frac{4 q_{max} \Delta\omega \left| H(K-1) \right|}{V_{H1}}$$

$$\theta_k = \theta - \angle H(K-1)$$

$$\Gamma(t) = \frac{1}{2} \frac{4 q_{max} \Delta\omega \left| H(-1) \right|}{V_{H1}} \cos\left(\theta - \angle H(-1)\right)$$

$$+ \sum_{K=1}^{N} \frac{4 q_{max} \Delta\omega \left| H(K-1) \right|}{V_{H1}} \times \cos\left(K\omega_0 t + \theta - \angle H(K-1)\right)$$