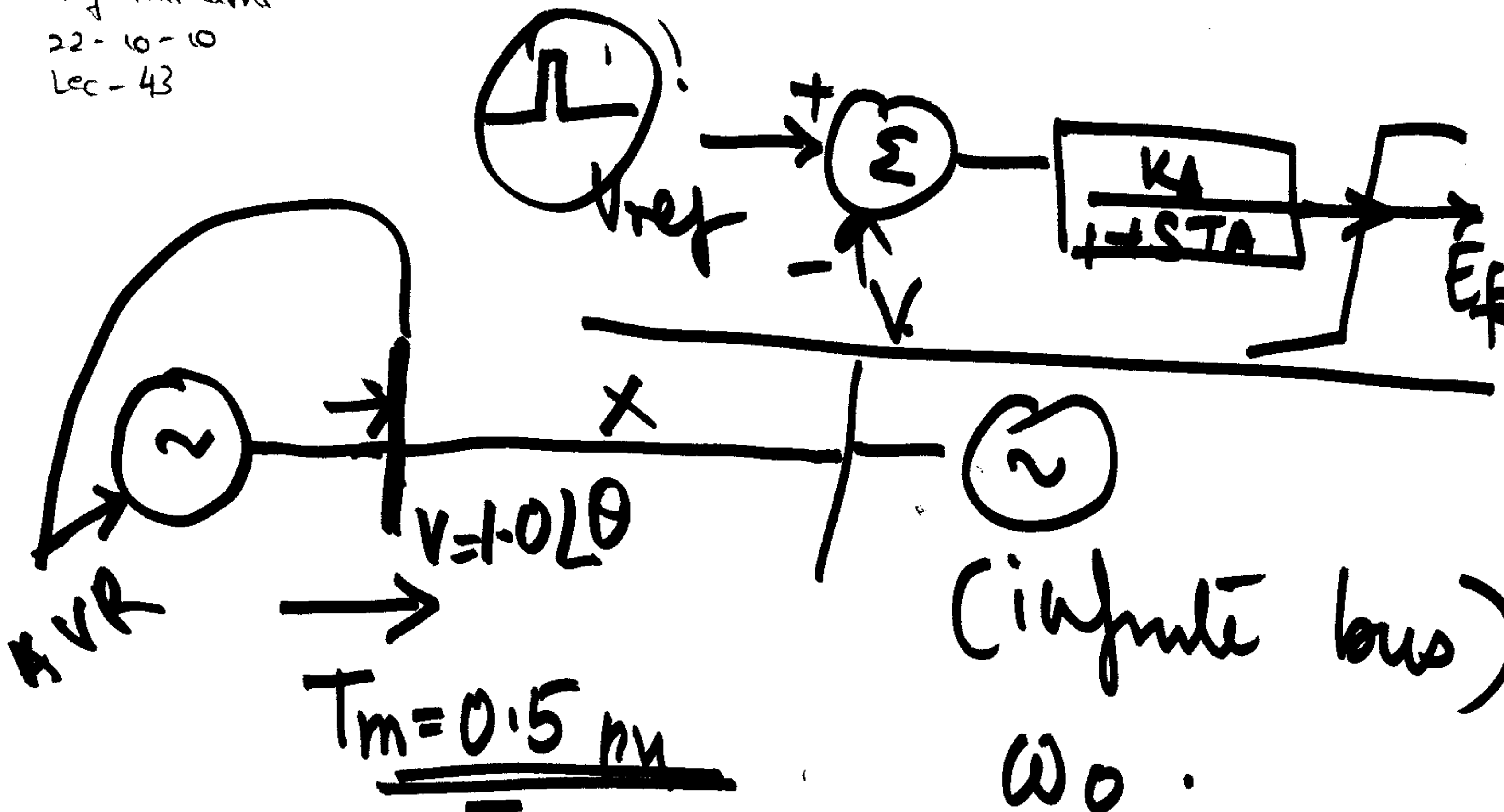
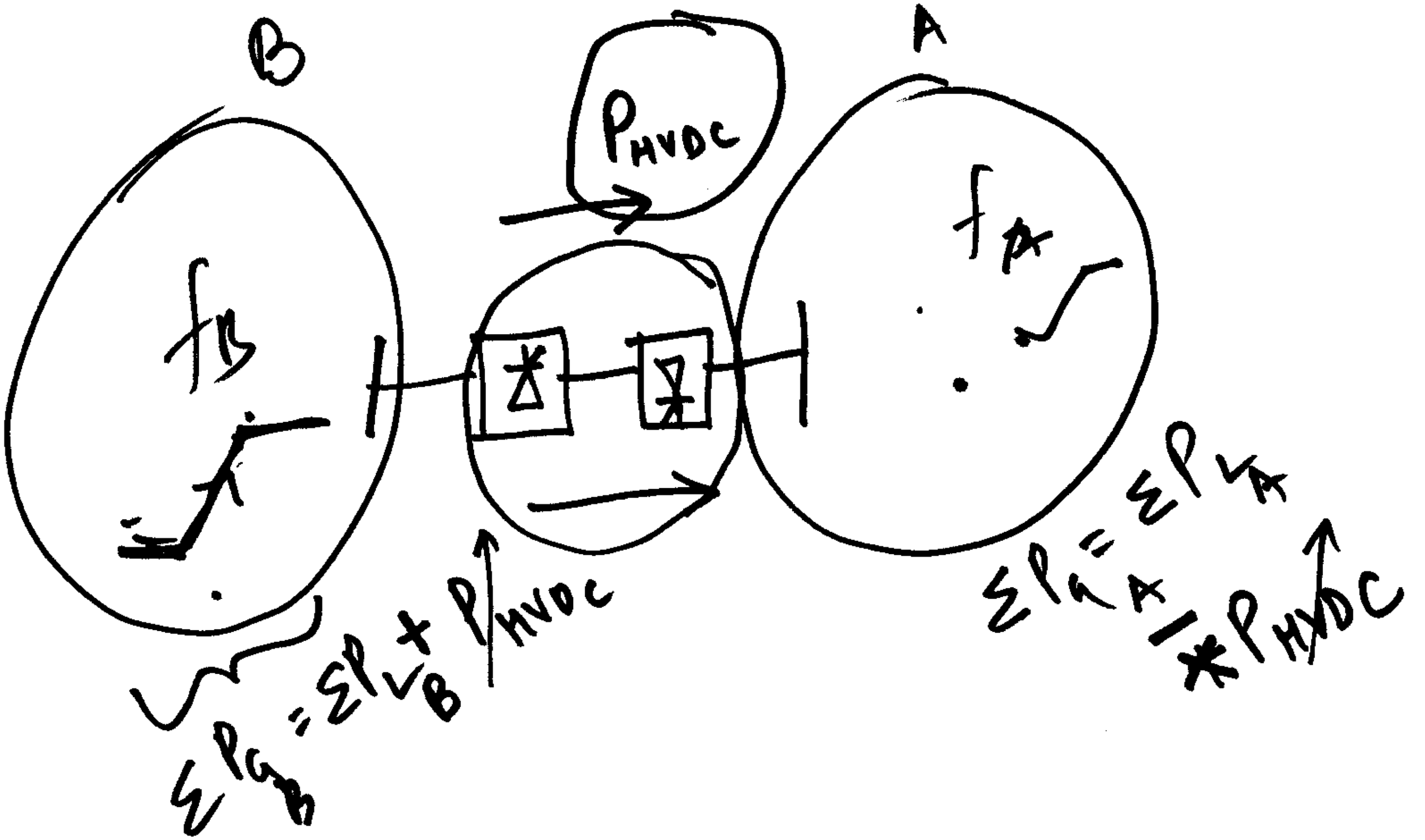
Prof. Kulkarni
22-10-10
Lec-43



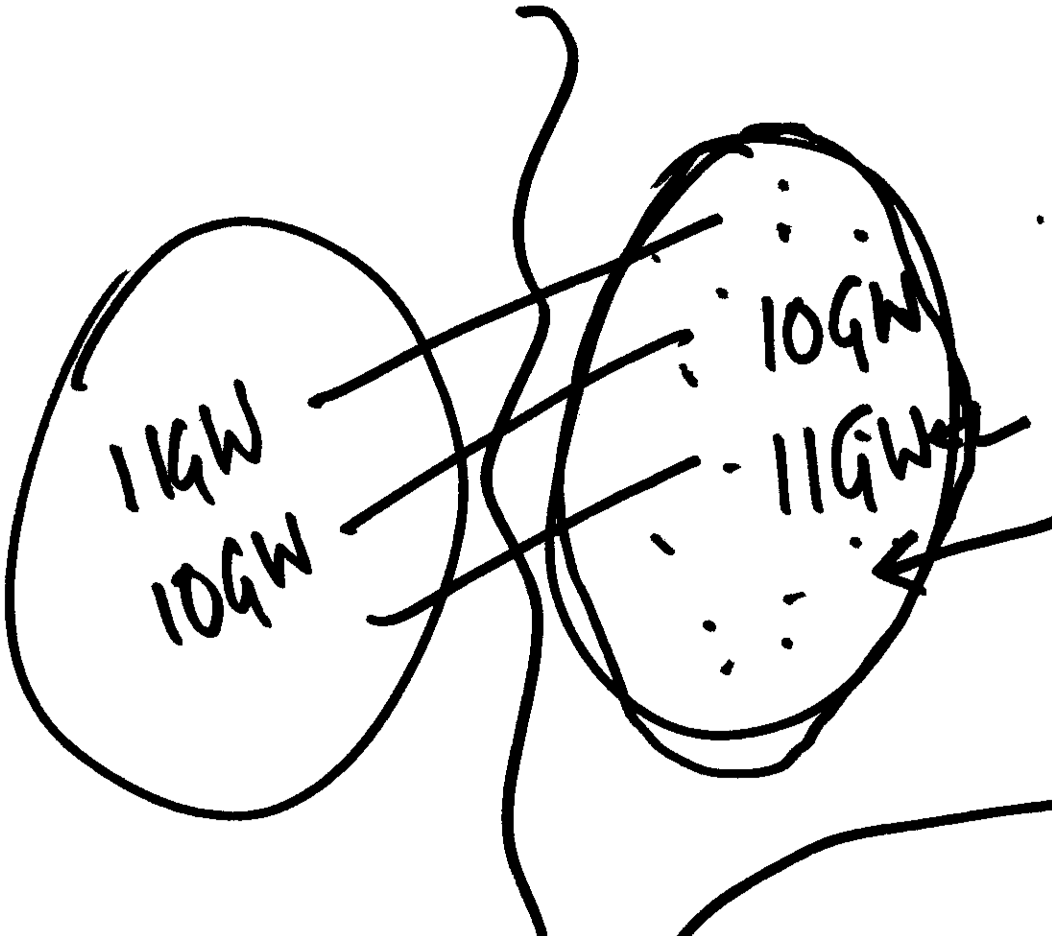
$T_m = 0.5\ pu$

$= T_e$

$= P_e$.



Async. connections between A & B.



$$w_{cov}(t) = \frac{\sum H_i \, w_i(t)}{\sum H_i}$$

$$\frac{2(\sum H_i)}{\omega_B} \frac{d\,\omega_{coi}}{dt} = \sum P_m - \sum P_e$$

$$= \sum P_m - \sum P_L - \text{losses}$$

= imbalance

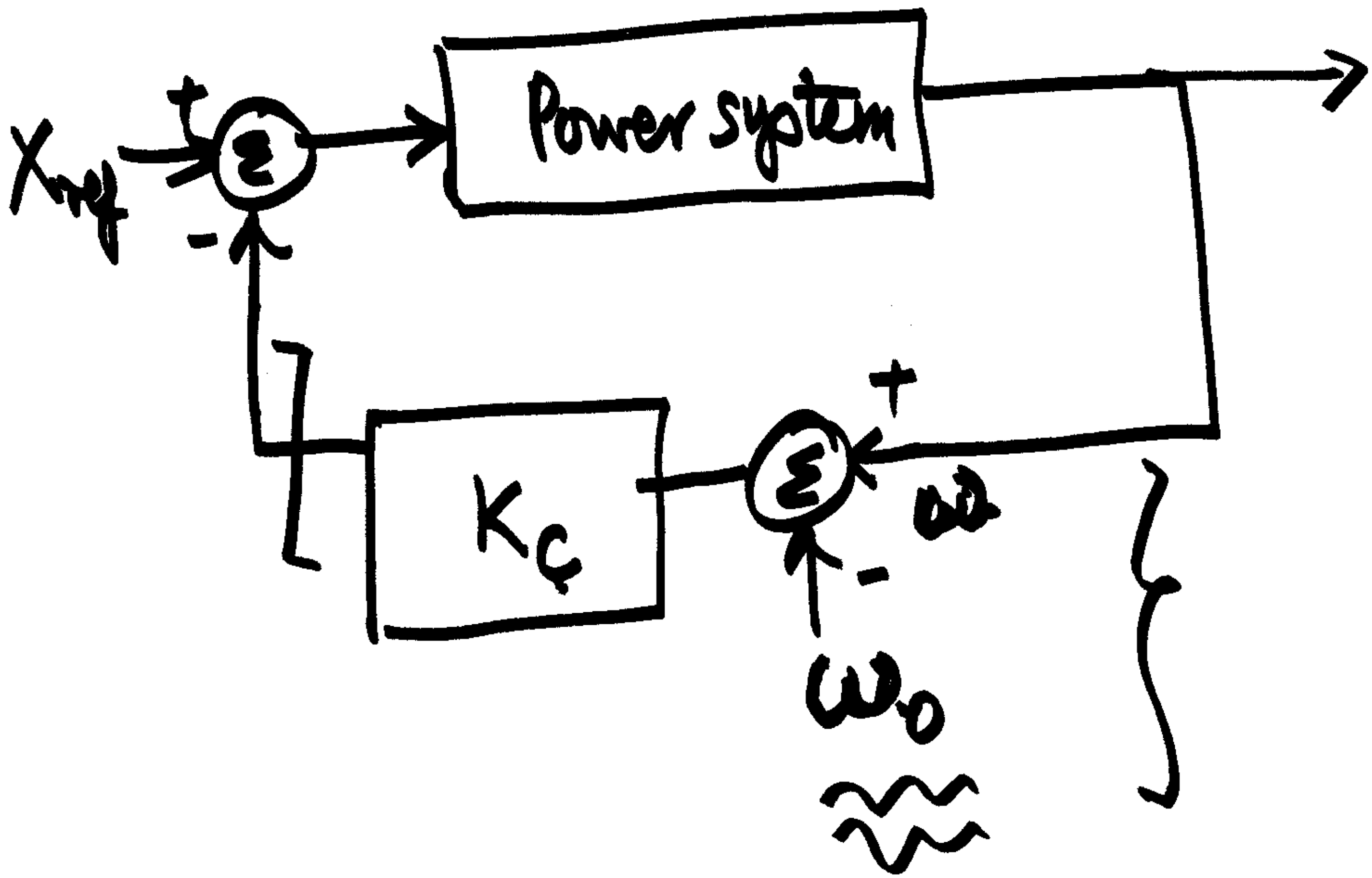
$$\omega_{coi}(t) = \frac{\sum H_i \omega_i(t)}{\sum H_i}$$

$$\sum P_e = \sum P_L + \text{losses.}$$

Prof. A. M. Kulkarni
Date - 29/10/10 -

$$\Delta X \rightarrow -K_c(\omega - \omega_0)$$

X inductive reactance



$$\frac{d\Delta\delta}{dt} = \Delta\omega$$

$$\frac{2H}{\omega_B}\frac{d\Delta\omega}{dt} = -K\Delta\delta - \left.\frac{\partial P_e}{\partial X}\right| \Delta X.$$

$$P_e = \frac{E E_b \sin\delta}{X}$$

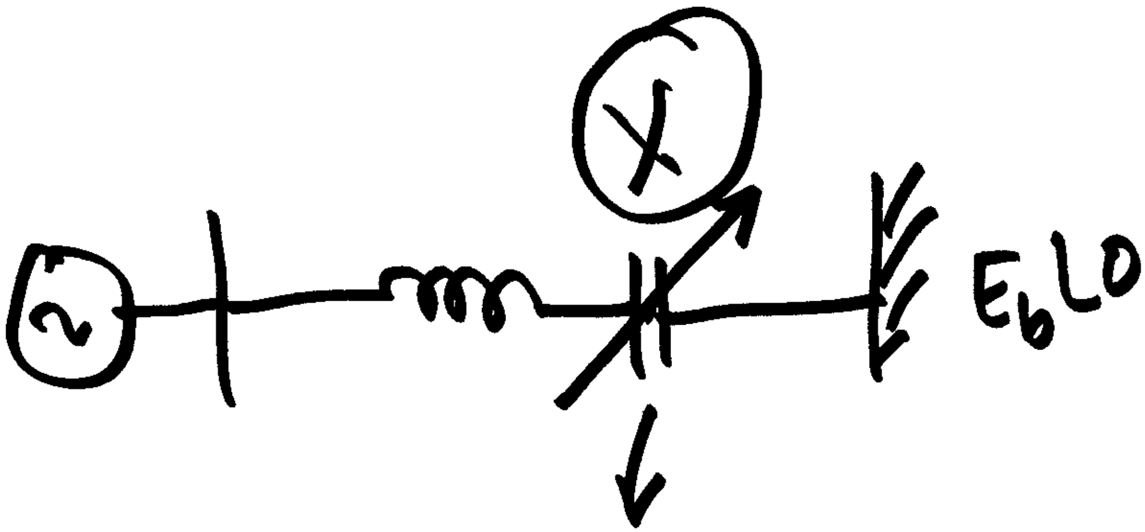
$$\frac{\partial P_e}{\partial X} = \frac{-E E_b \sin\delta_e}{X_e^2}$$

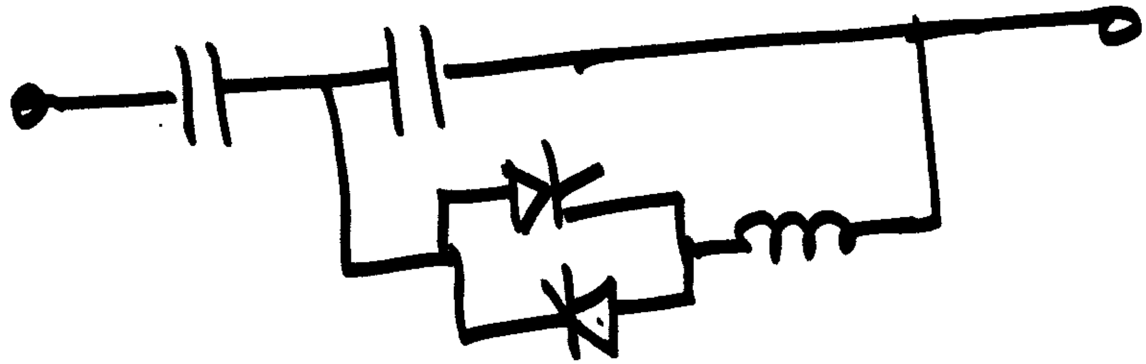
$$P_e = K_1 \sin\delta = \frac{E E_b \sin\delta}{X}$$

$$\Delta X$$

$$\frac{d\Delta\delta}{dt} = \Delta\omega$$

$$\frac{2H}{\omega_B}\frac{d\Delta\omega}{dt} = -\Delta P_e = -\frac{\partial P_e}{\partial \delta}\bigg|\Delta\delta - \frac{\partial P_e}{\partial X}\bigg|\Delta X$$


EbLO



$$\frac{d\Delta\delta}{dt} = \Delta\omega$$

$$\frac{2H}{\omega_B}\frac{d\Delta\omega}{dt} = -K\Delta\delta - \left(\frac{-E E_b \sin\delta_e}{x_e^2}\right) \times \left[-K_c(\omega-\omega_0)\right]$$

$(\omega - \omega_0)$: ↑ $\Delta\omega$.

$$= -\overset{>0}{K}\Delta\delta - \overset{>0\,-}{D}\Delta\omega$$

$$\frac{d\Delta\delta}{dt} = \Delta\omega$$

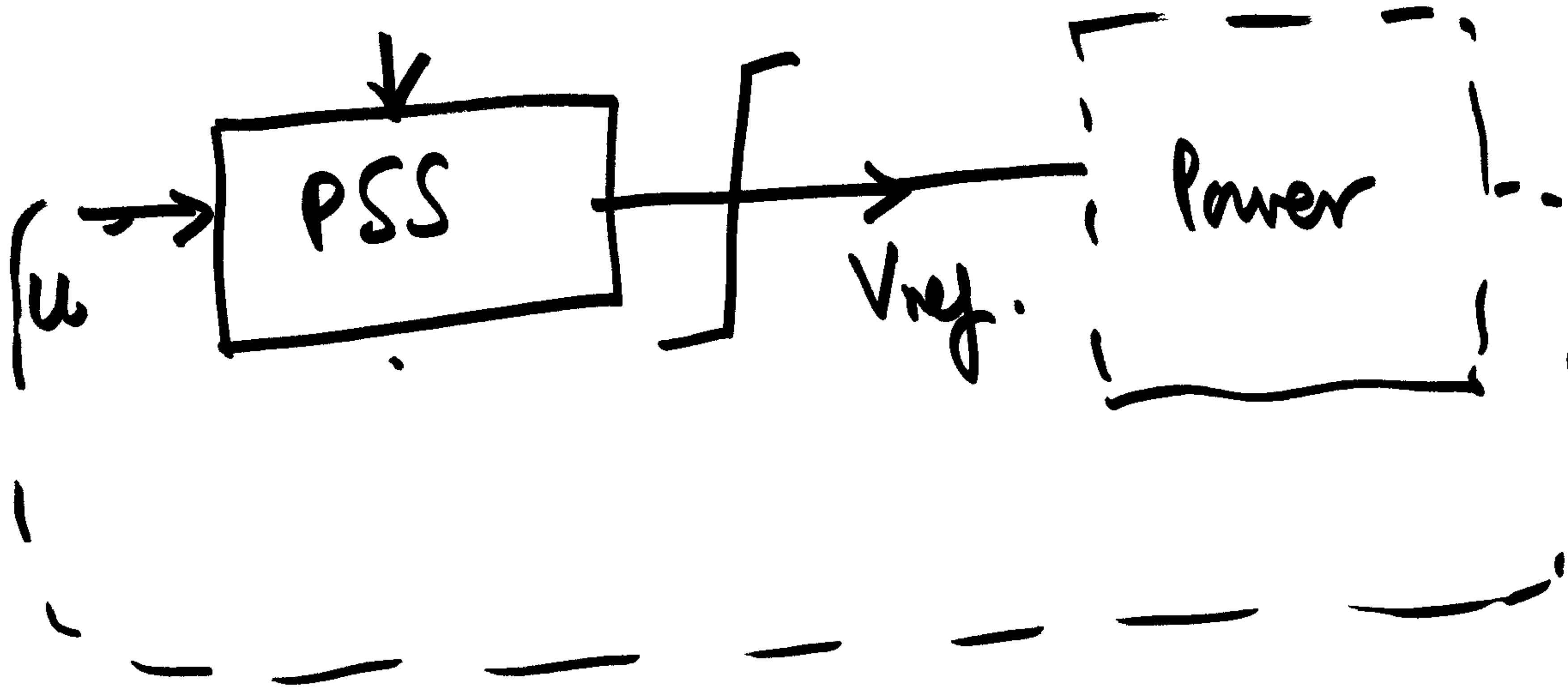
$$P_e = K_1 \sin\delta .$$

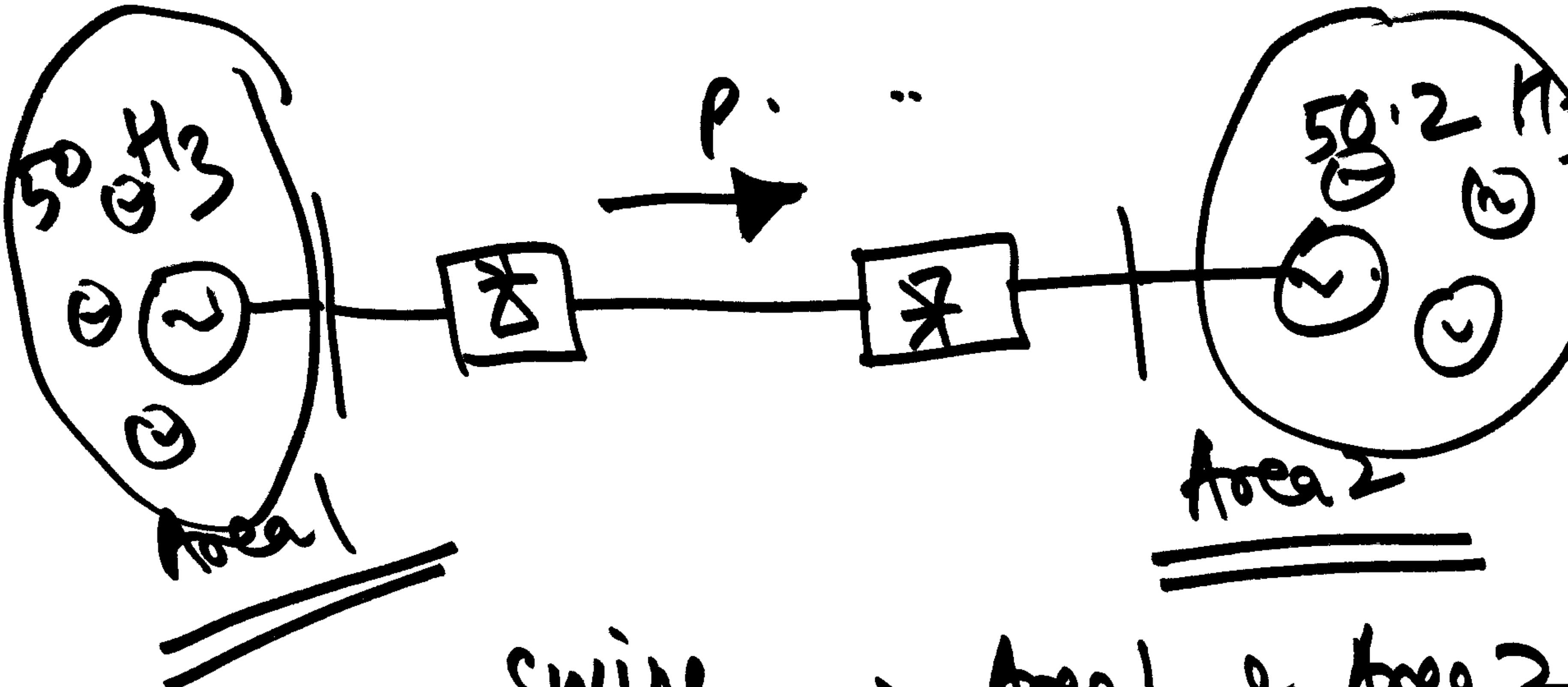
$$K_1 = \frac{E E_b}{X}$$

$$\frac{2H}{\omega_B}\frac{d\omega}{dt} = P_m - P_e .$$

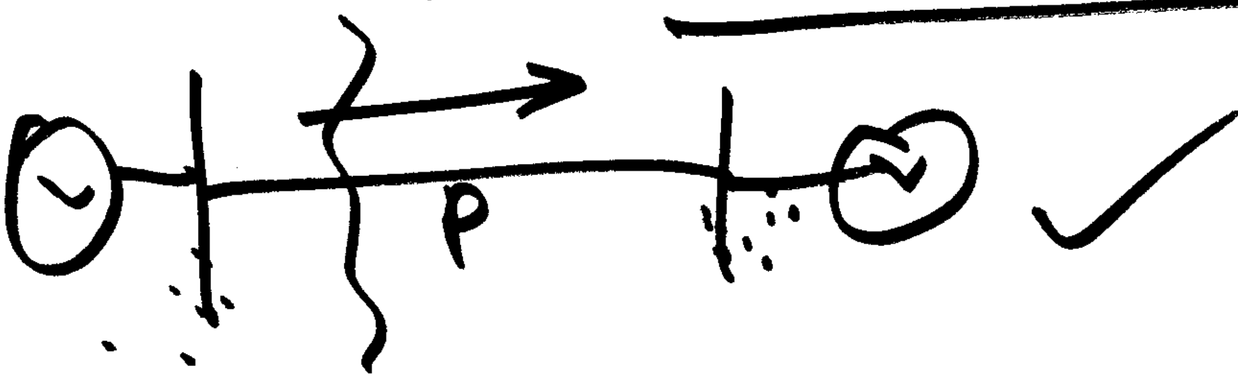
$$K = K_1 \cos\delta$$

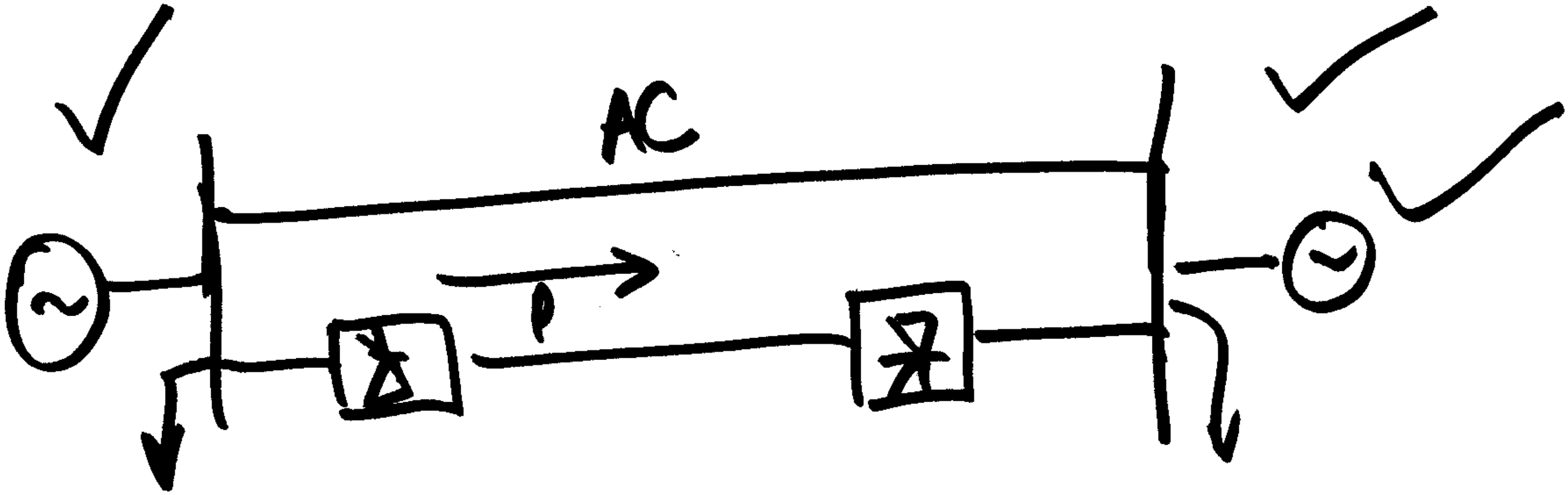
$$\frac{2H}{\omega_B}\frac{d\Delta\omega}{dt} = -\left.\frac{\partial P_e}{\partial \delta}\right|_{\delta=\delta_e} \Delta\delta .$$

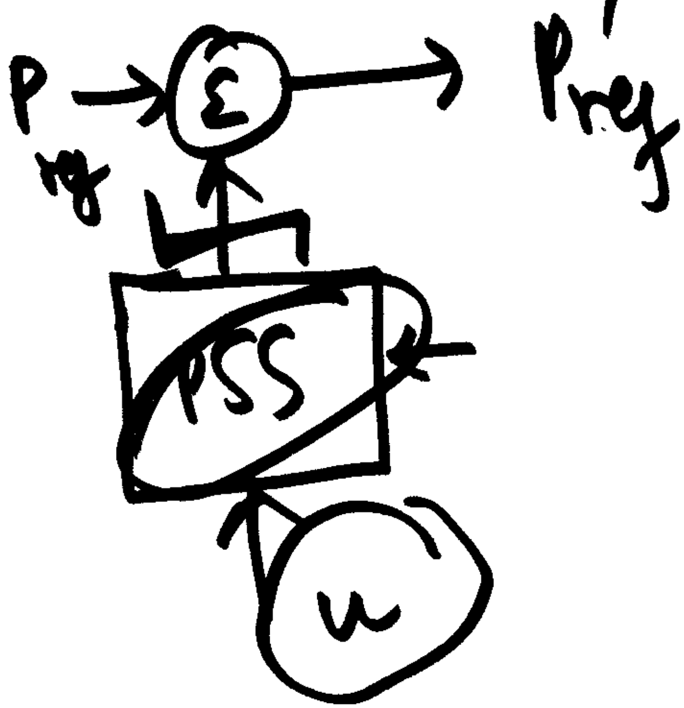

PSS
ω
Vref.
Power



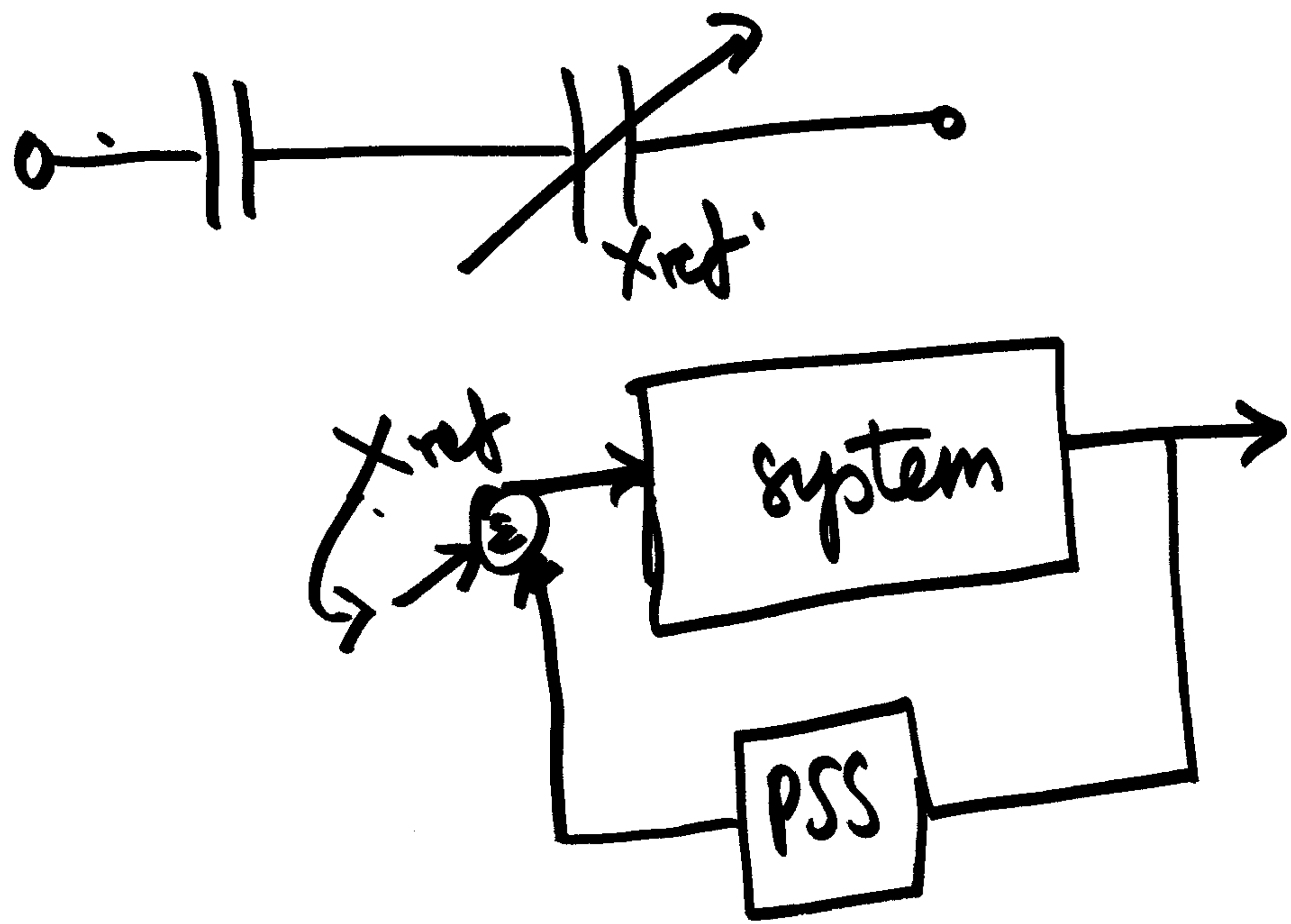
swing → Area1 & Area2

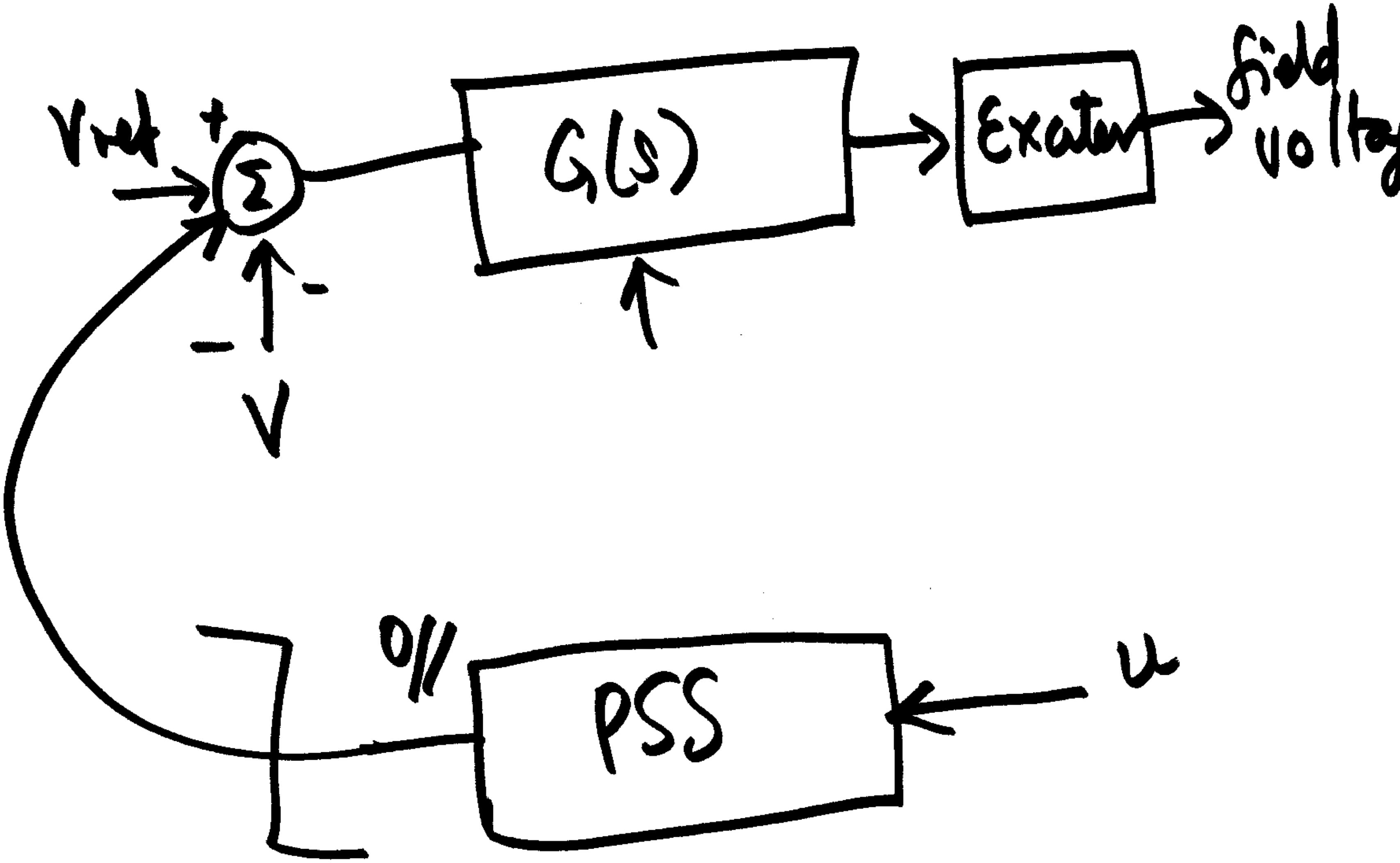


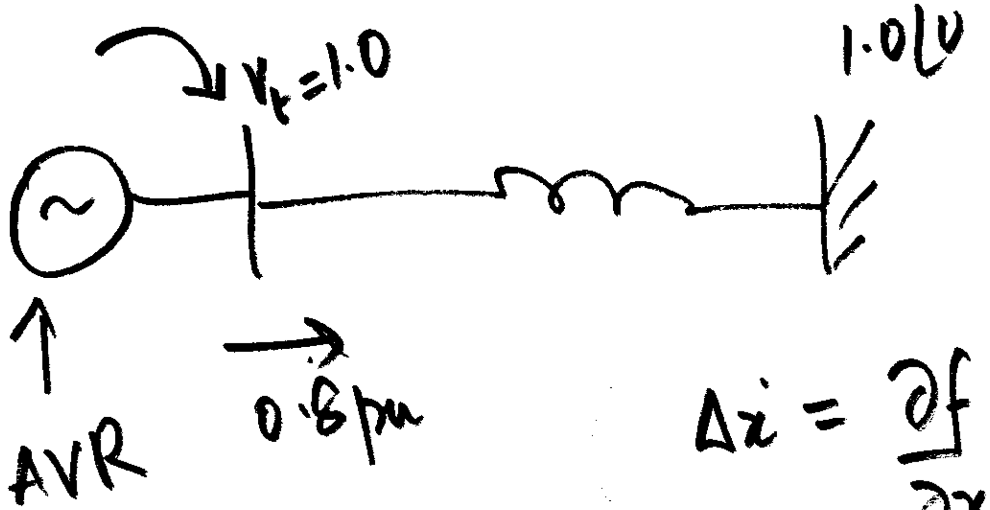




synch.


Xref
Xref
system
PSS

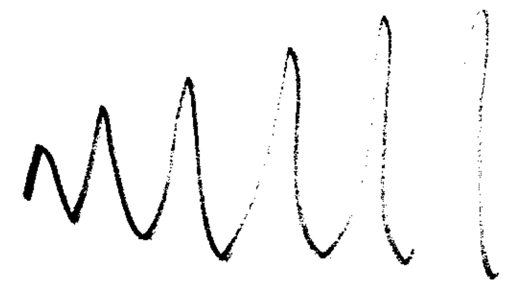

Vref
+
Σ
-
-
V
G(s)
Exciter
field voltage
0/1
PSS
u



$$\Delta \dot{x} = \left.\frac{\partial f}{\partial x}\right|_{x=x_e} \Delta x + \left.\frac{\partial f}{\partial u}\right|_{x=x_e} \Delta u$$

Vref

0.8 pu



$$\dot{x} = f(x, u) \leftarrow$$