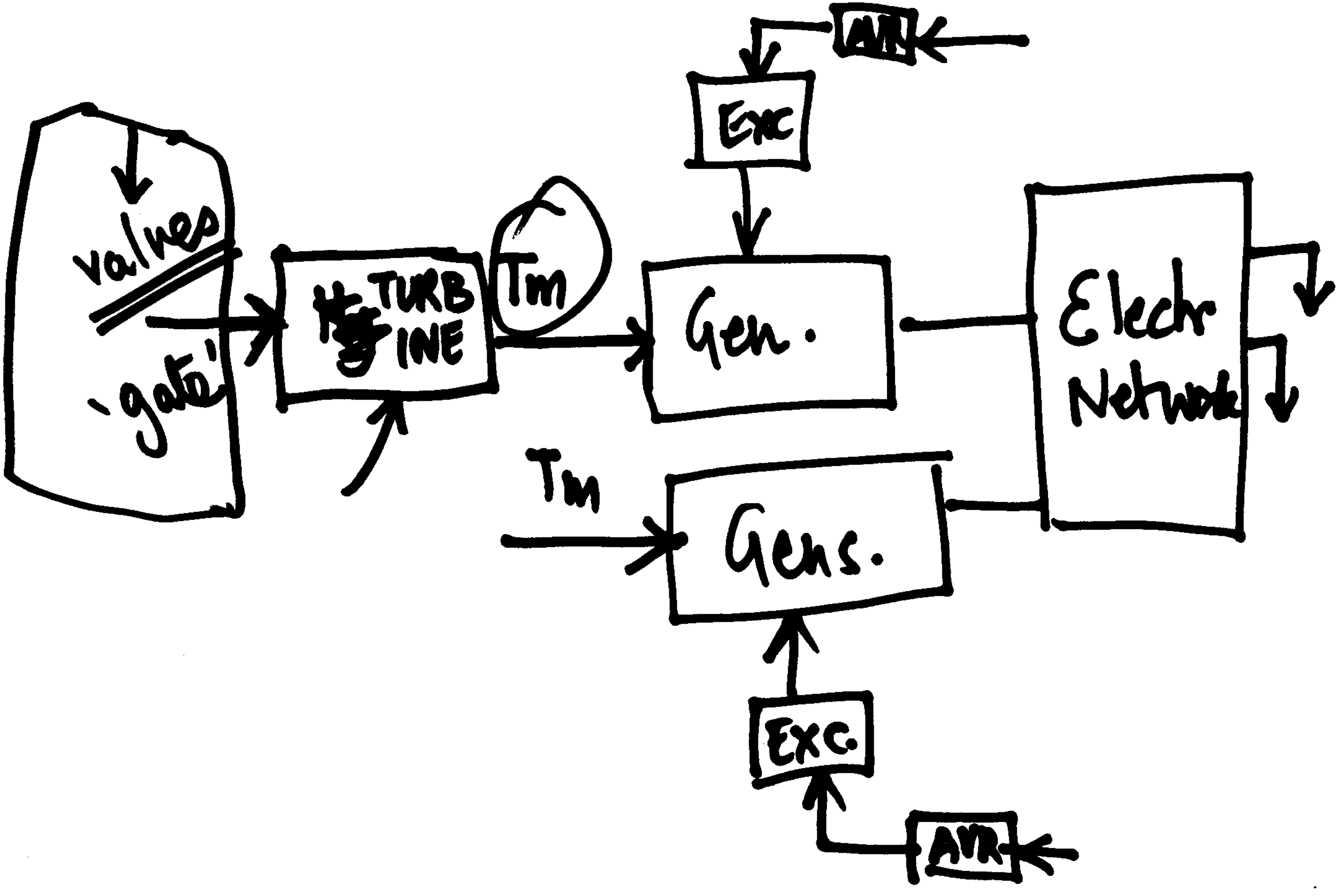
Prof. A.M. Kulkarni
Date: 20/8/10
Lec. No. 34

Transmission Line

↳ Distributed

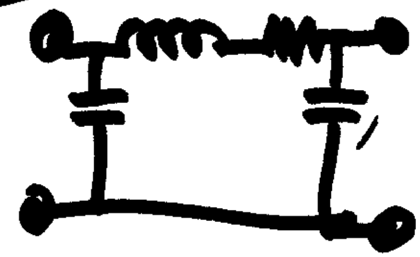
↙ Lossless



valves
'gate'
TURBINE
Tm
Gen.
Exc
AVR
Elecr
Network
Tm
Gens.
Exc.
AVR

Transmission
(Distributed P).

SINUSOIDAL



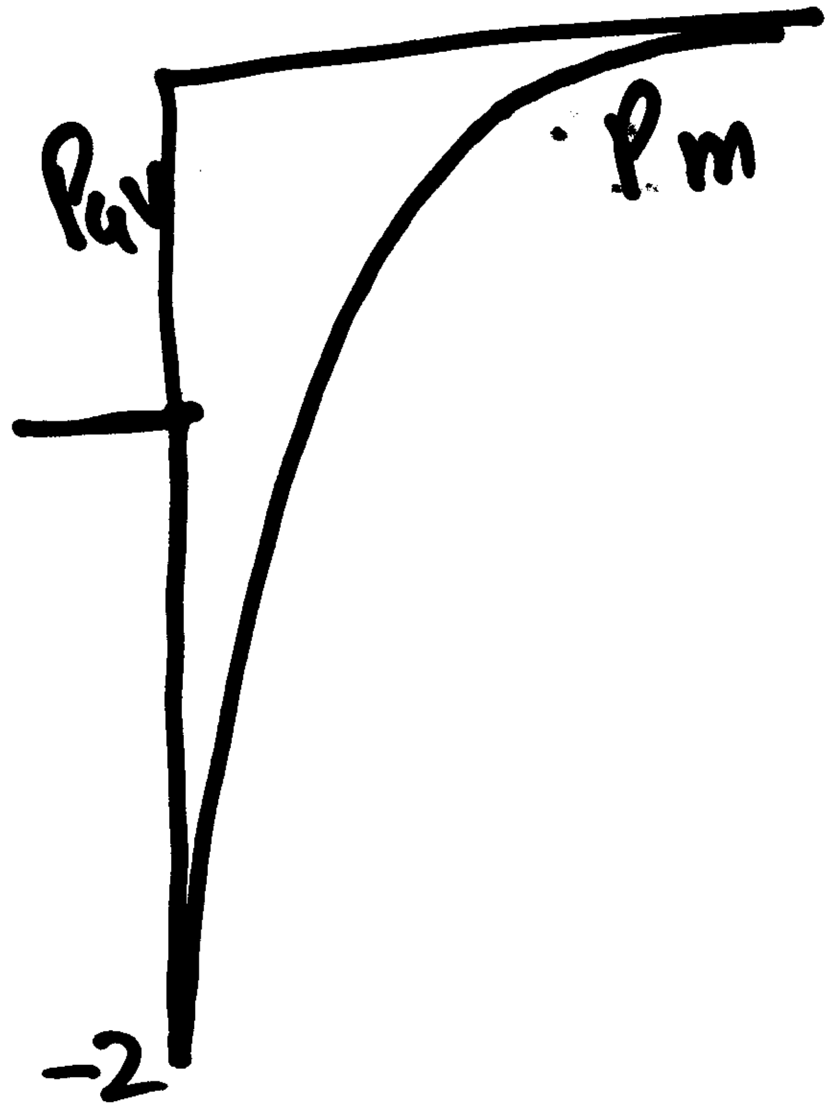
Lossless → Travelling Wave → Algebraic

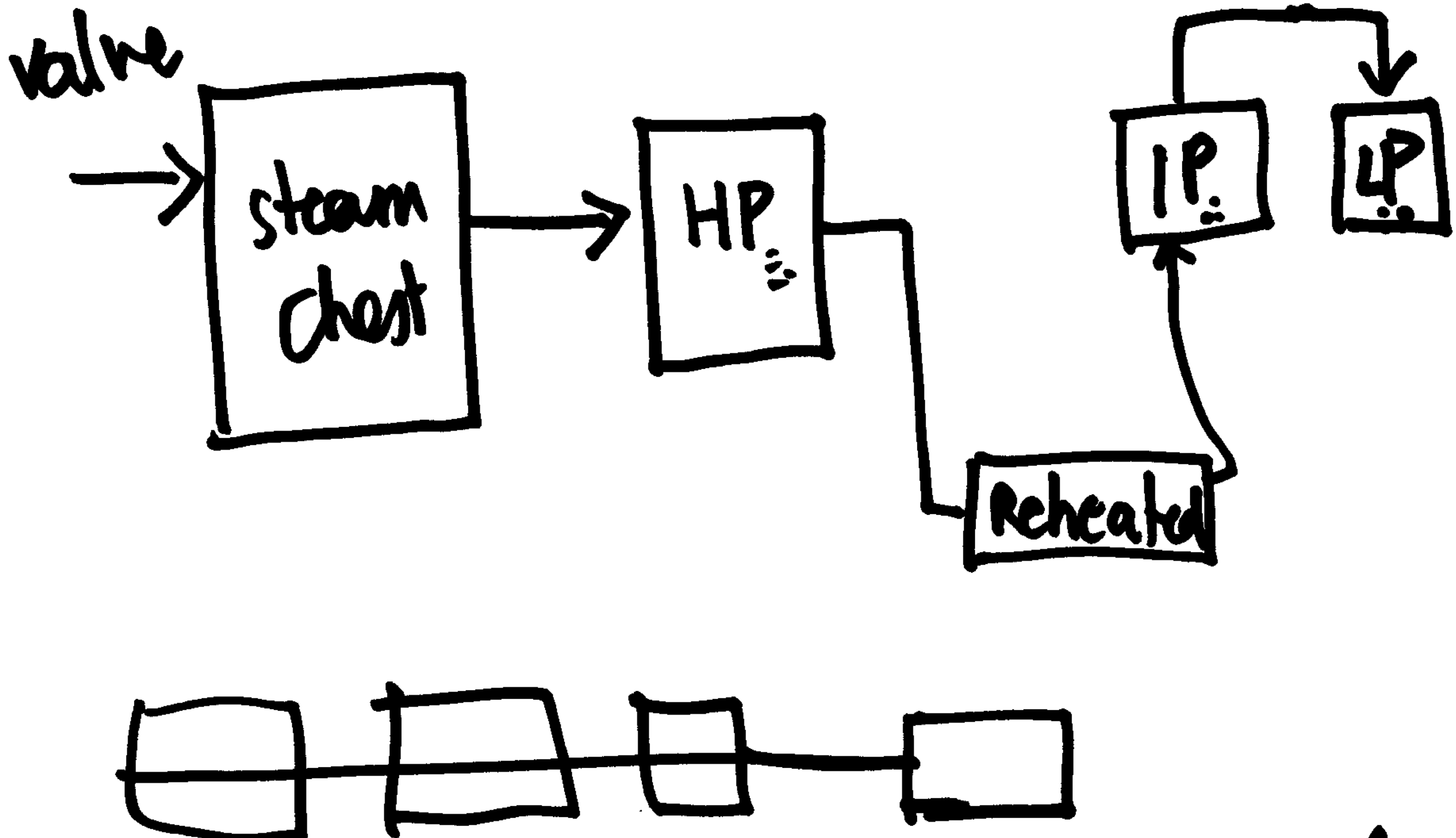
Lossy → Lossless + R

LOSSY = LOSSLESS

R

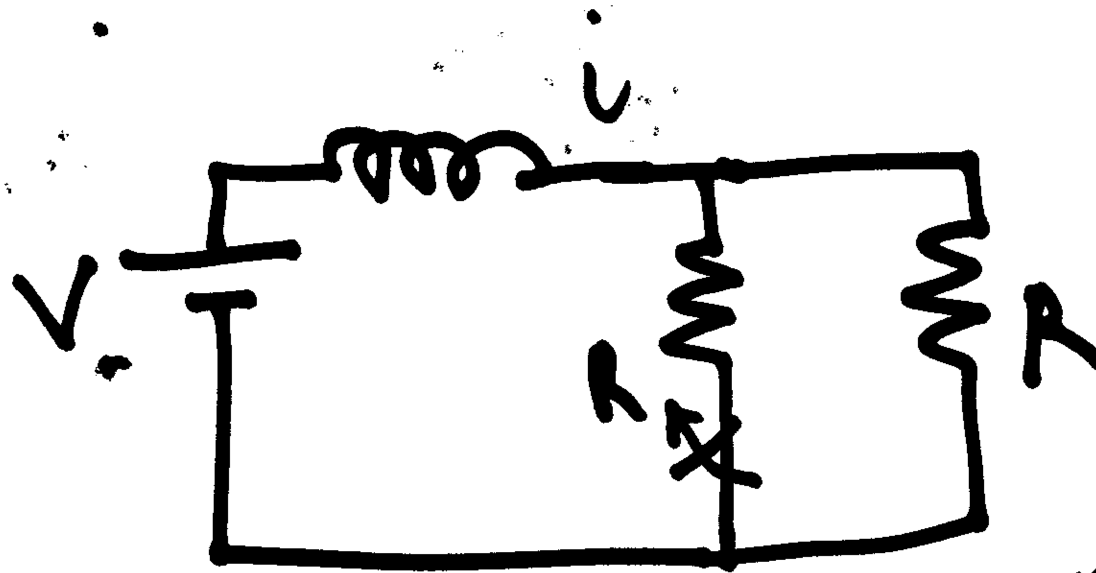
$\frac{d}{c}$


Pav
Pm
-2



Tandem Compound.

$$\frac{V^2}{R}$$

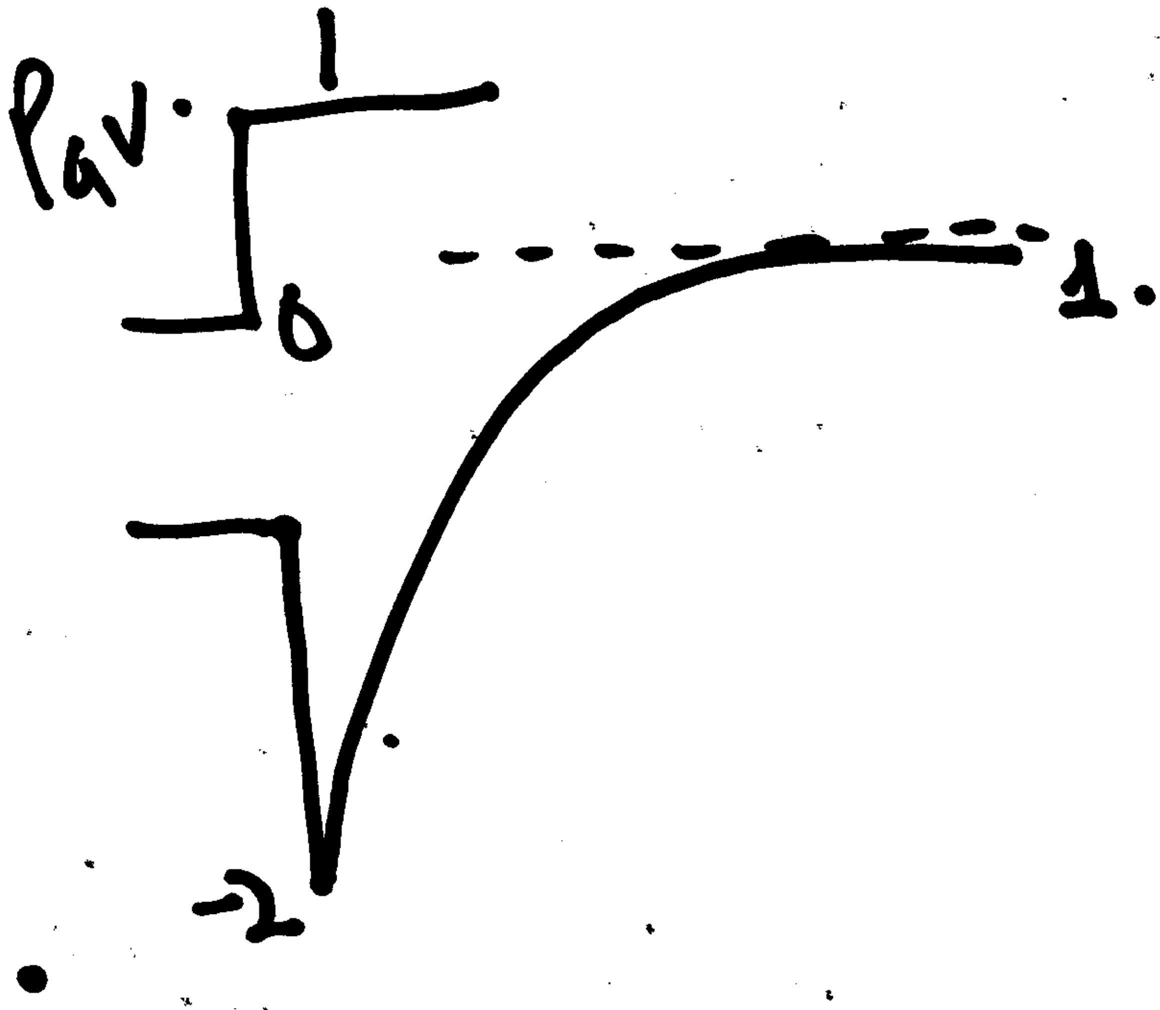


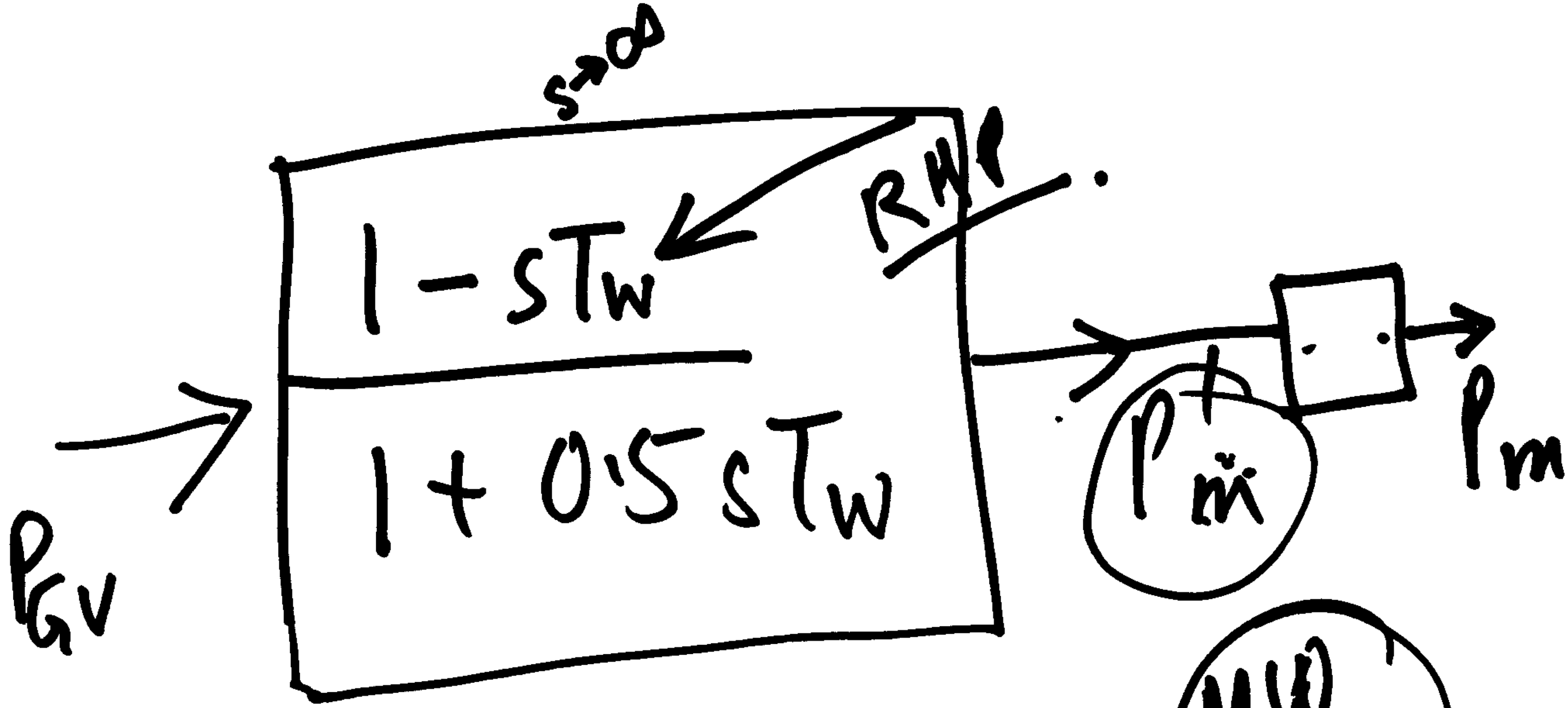
$$\left(\frac{V}{R/2}\right)^2 \times R.$$

$$\frac{V^2}{R^2/4} \times R$$

before $\left(\frac{V^2}{R/2}\right)$

after: $\frac{V^2}{R}.$


Pav.
1
0
1.
-2



$+\frac{1}{T_W}$

$$\frac{2H}{\omega_B}\frac{d\omega}{dt} = T_m - T_e \approx P_m - P_e$$

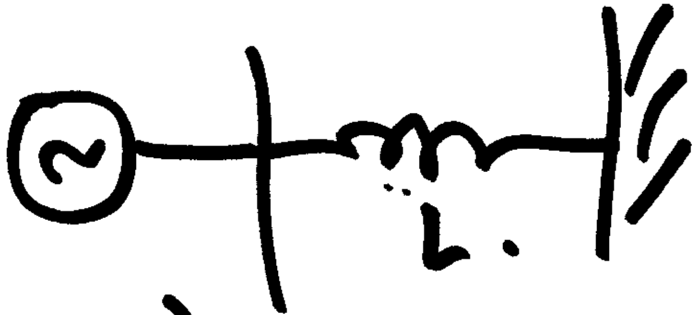
$$\frac{di_d}{dt} = -\omega i_q + \frac{V_{d1} - V_{d2}}{L_+}.$$

$$\frac{di_q}{dt} = \omega i_d + \frac{(V_{q1} - V_{q2})}{L_-}$$

$$\frac{di_0}{dt} = \frac{V_{01} - V_{02}}{L_0}.$$

$$L_+ = L_- = L_s - L_m$$

$$L_0 = L_s + 2L_m.$$



$C_p(\theta)$

$$0 = -\omega i_q + \frac{V_{d1} - V_{d2}}{L_t}$$

$$0 = \omega i_d + \frac{V_{q1} - V_{q2}}{L_t}$$

$$(i_q + j i_d) = \frac{(V_{q1} + j V_{d1}) - (V_{q2} + j V_{d2})}{j \omega L_t}$$

3 phase line

$$\begin{bmatrix} L_s & L_m & L_m \\ L_m & L_s & L_m \\ L_m & L_m & L_s \end{bmatrix} \begin{bmatrix} \frac{di_a}{dt} \\ \frac{di_b}{dt} \\ \frac{di_c}{dt} \end{bmatrix} = \begin{bmatrix} V_{a_1} - V_{a_2} \\ V_{b_1} - V_{b_2} \\ V_{c_1} - V_{c_2} \end{bmatrix}$$

$$f^{abc} = \underline{C_p} f^{dq0}.$$

$\theta = \omega t$

$$\underline{\underline{C_p(\theta)}}.$$