29/9/10
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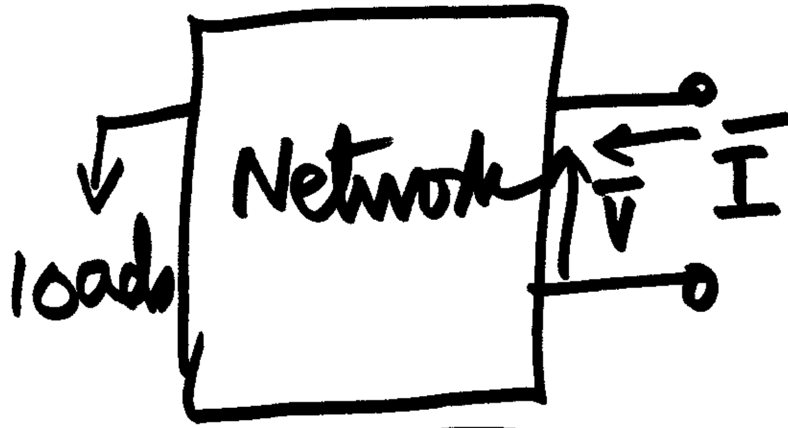
Lec No. 39



$\psi_d \leftrightarrow i_d$
$\psi_q \leftrightarrow i_q$

$\frac{d\psi_d}{dt} = 0$

$\frac{d\psi_q}{dt} = 0$

$\leftrightarrow$

$\bar{I} = Y\bar{V}$

$R_V(i_Q + j i_D) = (V_Q + j V_D)$

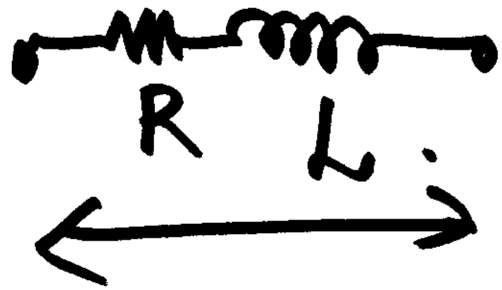
Generator states.

current injections.

$\bar{I} = (i_{Q\,inj} + j\, i_{D\,inj})$

$\bar{V} = (v_Q + j v_D)$.

$\frac{dV_D}{dt}=0, \frac{dV_Q}{dt}=0$ $\frac{di_D}{dt}=0$ $\frac{di_Q}{dt}=0$



Algebraic

$(R+j\omega L)(i_Q+ji_D) = (v_Q+jv_D)$

$\underline{\underline{C_K}}$.

Loadflow $\leftarrow$ Base Loadflow.

$\downarrow$

$\boxed{\text{Equilibrium}}$

$$\dot{x} = f(x, y, u)$$
$$0 = g(x, y, \cancel{u})$$

Explicits

R-K 4th order

0.01s

$x \to$ STATES $\psi, \delta, \omega,$
x_E, x_{GT}

$y \to V, i, \psi_d, \psi_q,$
P, Q

$$g(x_{k+1}, y_{k+1}) = 0$$

$$\frac{x_{k+1} - x_k}{h} = f(x_k, y_k, u_k)$$

$$0 = g(x_k, y_k)$$

~~explicit~~

partitioned explicit

$$x_k \longrightarrow y_k$$

$$0 = g(x, y)$$

$$\cancel{0 = Ax + g'(y)}$$

$$\underline{0 = Ay + g'(x)}$$

$$\underline{g(x,y) = Ay + g'(x)}$$

$$Ay_k = -g'(x_k)$$

$$0 = Ay + g'(x)$$ ← $x_d'' \neq x_q''$

$y \to 14$

$x \to 16.$

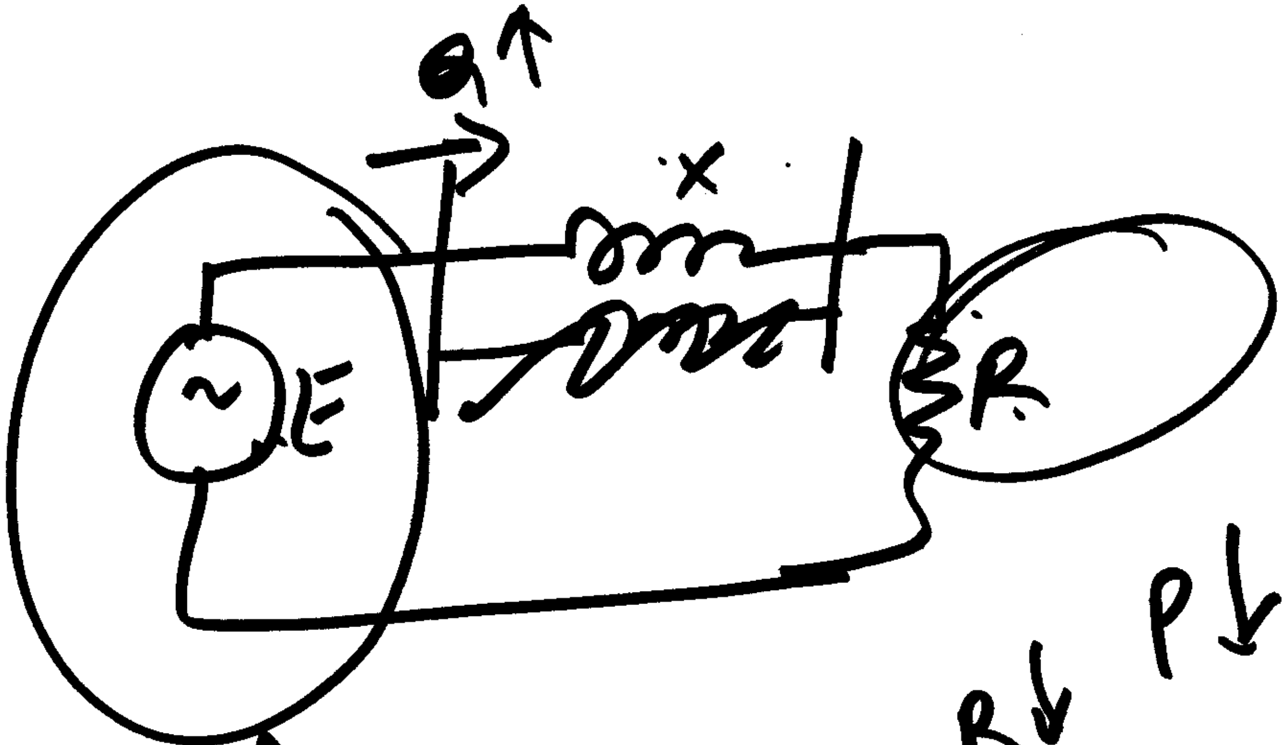
A^{-1}

$A \leftarrow$ sparse

A^{-1}

$$Ay_k = -g'(x_k)$$

$$y_k = -\underline{\underline{A^{-1}}}\, g'(x_k).$$



$R\downarrow \; P\downarrow \; X$

generator