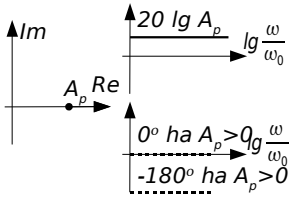
PT0

$$x_{ki}(t)=A_p\cdot x_{be}(t)$$

$$v(t)=A_p\cdot 1(t)$$

$$y(t)=A_p\cdot\delta(t)$$

$$Y(j\omega)=A_p$$



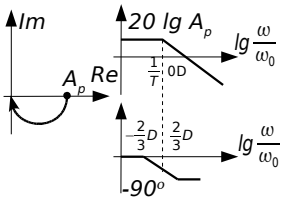
PT1

$$T\cdot\frac{dx_{ki}(t)}{dt}+x_{ki}(t)=A_p\cdot x_{be}(t)$$

$$v(t)=A_p\cdot\left(1-e^{-\frac{t}{T}}\right)$$

$$y(t)=A_p\cdot e^{-\frac{t}{T}}$$

$$Y(j\omega)=\frac{A_p}{1+j\omega T}$$



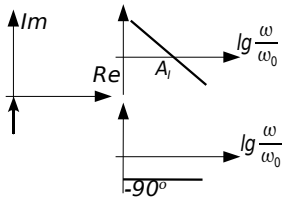
IT0

$$T\cdot\frac{dx_{ki}(t)}{dt}=A_p\cdot x_{be}(t)$$

$$v(t)=A_I\cdot t=\frac{A_p}{T}\cdot t$$

$$y(t)=A_I$$

$$Y(j\omega)=\frac{A_I}{j\omega}$$



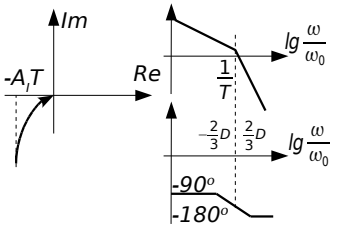
IT1

$$T\cdot\frac{d^{2x}_{ki}(t)}{dt^2}+\frac{dx_{ki}(t)}{dt}=A_I\cdot x_{be}(t)$$

$$v(t)=A_I\cdot\left[t-T\left(1-e^{-\frac{t}{T}}\right)\right]$$

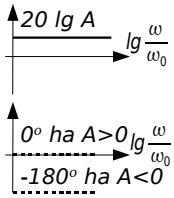
$$y(t)=A_I\left(1-e^{-\frac{t}{T}}\right)$$

$$Y(j\omega)=\frac{A_I}{j\omega}\cdot\frac{1}{1+j\omega T}$$

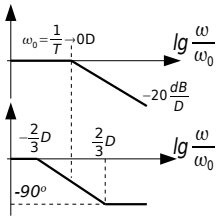


BHM 2006

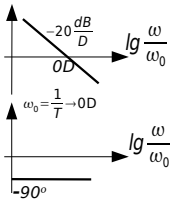
$$Y(j\omega)=A$$



$$Y(j\omega)=\frac{1}{1+j\omega T}$$



$$Y(j\omega)=\frac{1}{j\omega T}$$



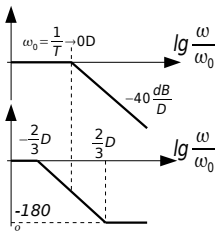
$$Y(j\omega)=\frac{1}{1+2\xi j\omega T+(j\omega T)^2}\qquad Y(j\omega)=1+2\xi j\omega T+(j\omega T)^2$$

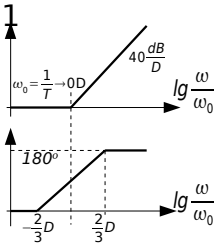
ha $\xi > 1$

$$Y(j\omega)=\frac{1}{1+j\omega T_1}\cdot\frac{1}{1+j\omega T_2}\qquad Y(j\omega)=(1+j\omega T_1)\cdot(1+j\omega T_2)$$

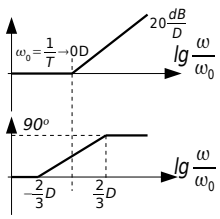
$$T_1=\frac{T}{\xi-\sqrt{\xi^2-1}}\qquad T_2=\frac{T}{\xi+\sqrt{\xi^2-1}}$$

ha $\xi \le 1$

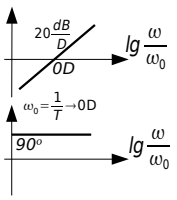




$$Y(j\omega)=1+j\omega T$$



$$Y(j\omega)=j\omega T$$



Impedanciaparaméterek

$$\begin{bmatrix} u_1 \\ u_2 \end{bmatrix} = \begin{bmatrix} Z_{11} & Z_{12} \\ Z_{21} & Z_{22} \end{bmatrix} . \begin{bmatrix} i_1 \\ i_2 \end{bmatrix}$$

$$Z_{11} = \frac{u_1}{i_1}_{\,i_2=0} \qquad Z_{12} = \frac{u_1}{i_2}_{\,i_1=0}$$

$$Z_{21} = \frac{u_2}{i_1}_{\,i_2=0} \qquad Z_{22} = \frac{u_2}{i_2}_{\,i_1=0}$$

Admittanciaparaméterek

$$\begin{bmatrix} i_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} G_{11} & G_{12} \\ G_{21} & G_{22} \end{bmatrix} . \begin{bmatrix} u_1 \\ u_2 \end{bmatrix}$$

$$G_{11} = \frac{i_1}{u_1}_{\,u_2=0} \qquad G_{12} = \frac{i_1}{u_2}_{\,u_1=0}$$

$$G_{21} = \frac{i_2}{u_1}_{\,u_2=0} \qquad G_{22} = \frac{i_2}{u_2}_{\,u_1=0}$$

Egyéb jele: Y

Hibridparaméterek

$$\begin{bmatrix} u_1 \\ i_2 \end{bmatrix} = \begin{bmatrix} H_{11} & H_{12} \\ H_{21} & H_{22} \end{bmatrix} . \begin{bmatrix} i_1 \\ u_2 \end{bmatrix}$$

$$H_{11} = \frac{u_1}{i_1}_{\,u_2=0} \qquad Z_{12} = \frac{u_1}{u_2}_{\,i_1=0}$$

$$H_{21} = \frac{i_2}{i_1}_{\,u_2=0} \qquad Z_{22} = \frac{i_2}{u_2}_{\,i_1=0}$$

Inverz hibridparaméterek

$$\begin{bmatrix} i_1 \\ u_2 \end{bmatrix} = \begin{bmatrix} K_{11} & K_{12} \\ K_{21} & K_{22} \end{bmatrix} . \begin{bmatrix} u_1 \\ i_2 \end{bmatrix}$$

$$K_{11} = \frac{i_1}{u_1}_{\,i_2=0} \qquad K_{12} = \frac{i_1}{i_2}_{\,u_1=0}$$

$$K_{21} = \frac{u_2}{u_1}_{\,i_2=0} \qquad K_{22} = \frac{u_2}{i_2}_{\,u_1=0}$$

Egyéb jele: D

Láncparaméterek

$$\begin{bmatrix} u_1 \\ i_1 \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} . \begin{bmatrix} u_2 \\ i_2 \end{bmatrix}$$

$$A_{11} = \frac{u_1}{u_2}_{\,i_2=0} \qquad A_{12} = \frac{u_1}{i_2}_{\,u_2=0}$$

$$A_{21} = \frac{i_1}{u_2}_{\,i_2=0} \qquad A_{22} = \frac{i_1}{i_2}_{\,u_2=0}$$

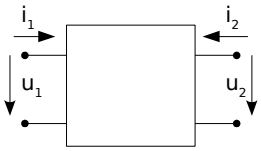
Inverz láncparaméterek

$$\begin{bmatrix} u_2 \\ i_2 \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} \\ B_{21} & B_{22} \end{bmatrix} . \begin{bmatrix} u_1 \\ i_1 \end{bmatrix}$$

$$B_{11} = \frac{u_2}{u_1}_{\,i_1=0} \qquad B_{12} = \frac{u_2}{i_1}_{\,u_1=0}$$

$$B_{21} = \frac{i_2}{u_1}_{\,i_1=0} \qquad B_{22} = \frac{i_2}{i_1}_{\,u_1=0}$$

1	Z_{11}	Z_{12}	Z_{21}	Z_{22}	ΔZ
K_{11}	1	$-K_{12}$	K_{21}	ΔK	K_{22}
B_{21}	$-B_{22}$	1	$-\Delta B$	B_{11}	$-B_{12}$
A_{21}	A_{11}	$-\Delta A$	1	$-A_{22}$	$-A_{12}$
H_{22}	ΔH	H_{12}	$-H_{21}$	1	H_{11}
ΔG	G_{22}	$-G_{12}$	$-G_{21}$	G_{11}	1



BHM 2006

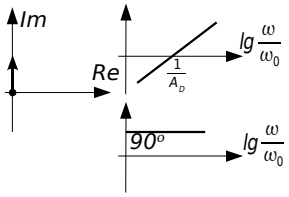
DT0

$$x_{ki}(t) = A_D \cdot \frac{dx_{be}(t)}{dt}$$

$$v(t) = A_D \cdot \delta t$$

$$y(t) = A_D \cdot \frac{d\delta(t)}{dt} \uparrow\downarrow_{dual\,dirac}$$

$$Y(j\omega) = j\omega A_D$$



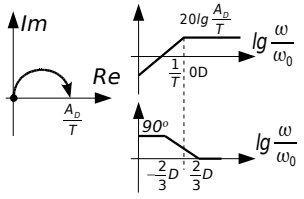
DT1

$$T \cdot \frac{dx_{ki}(t)}{dt} + x_{ki}(t) = A_D \cdot \frac{dx_{be}(t)}{dt}$$

$$v(t) = \frac{A_D}{T} e^{-\frac{t}{T}}$$

$$y(t) = \frac{-A_D}{T^2} e^{-\frac{t}{T}}$$

$$Y(j\omega) = \frac{j\omega A_D}{1 + j\omega T}$$



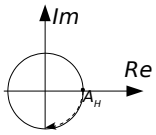
Holtidős tag

$$x_{ki}(t) = A_H \cdot x_{be}(t - T_H)$$

$$v(t) = A_H \cdot 1(t - T_H)$$

$$y(t) = A_H \cdot \delta(t - T_H)$$

$$Y(j\omega) = A_H \cdot e^{-j\omega T_H}$$



BHM 2006