

Otra parametrización

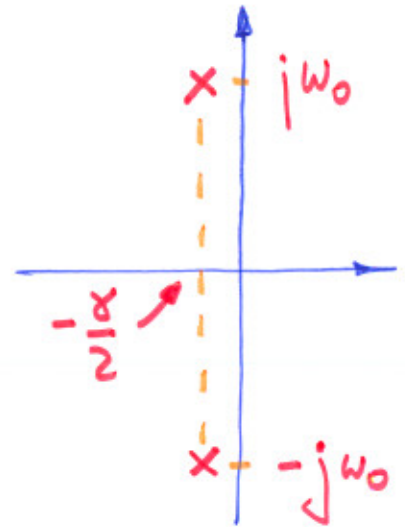
$$H(s) = \frac{\omega_0^2}{s^2 + \gamma s + \omega_0^2}$$

Polos:
$$p_{1,2} = -\frac{\gamma}{2} \pm j \omega_0 \sqrt{1 - \left(\frac{\gamma}{2\omega_0}\right)^2}$$

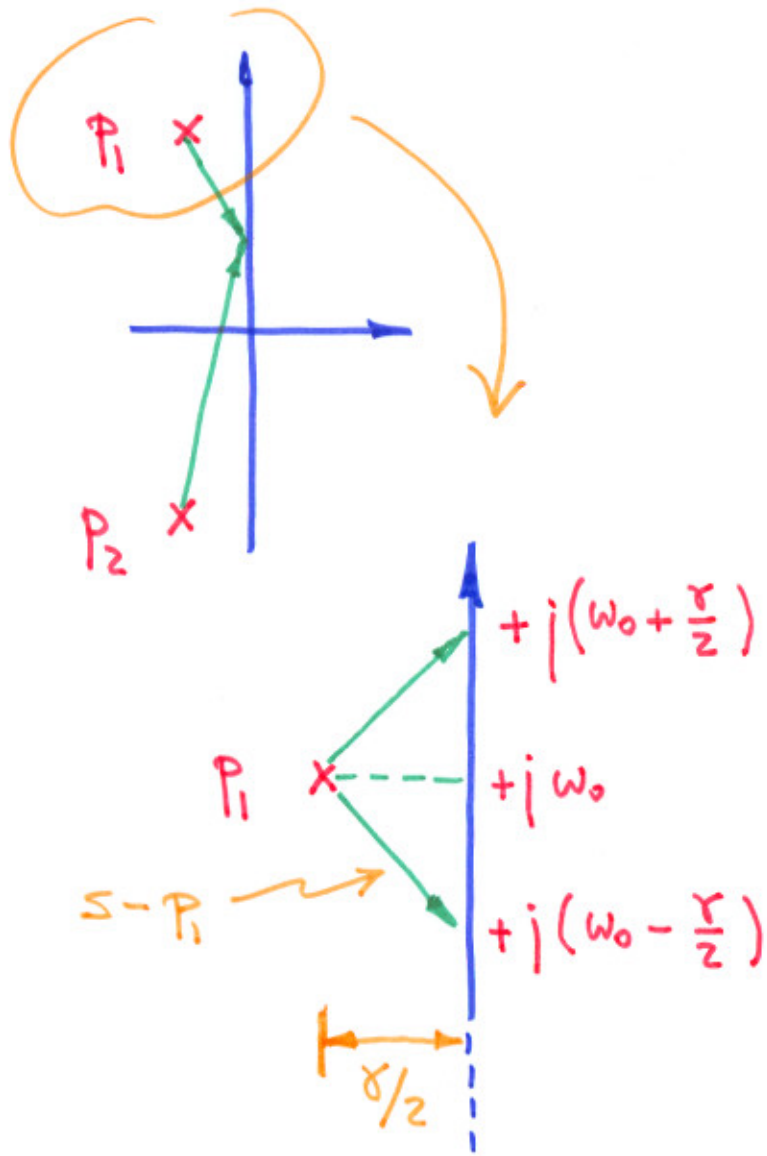
Si $\frac{\gamma}{2} \ll \omega_0$
$$p_{1,2} \approx -\frac{\gamma}{2} \pm j \omega_0$$



Sistema subamortiguado



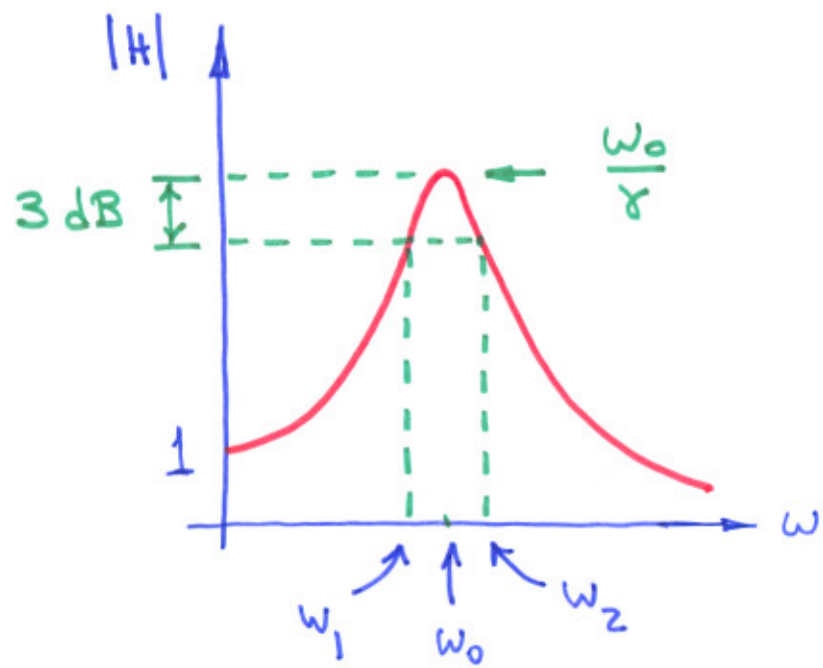
Sistema de 2º orden subamortiguado



Si $\gamma \ll \omega_0$ y $\omega \approx \omega_0$

$$|H(j\omega)| \approx \frac{\omega_0^2}{|s - p_1| \cdot 2\omega_0} = \frac{\omega_0}{2|s - p_1|}$$

$$= \begin{cases} \frac{\omega_0}{\gamma} & \text{en } j\omega_0 \\ \frac{\omega}{\sqrt{2}\gamma} & \text{en } j(\omega_0 \pm \frac{\gamma}{2}) \end{cases}$$



$$\left\{ \begin{array}{l} \omega_1 = \omega_0 - \frac{\omega}{2} \\ \omega_2 = \omega_0 + \frac{\omega}{2} \end{array} \right.$$

Factor de calidad

$$Q \equiv \frac{\omega_0}{BW} = \frac{\omega_0}{\gamma}$$

Si $Q \gg 1 \Rightarrow BW \ll \omega_0$

\Rightarrow circuito muy selectivo
en frecuencia