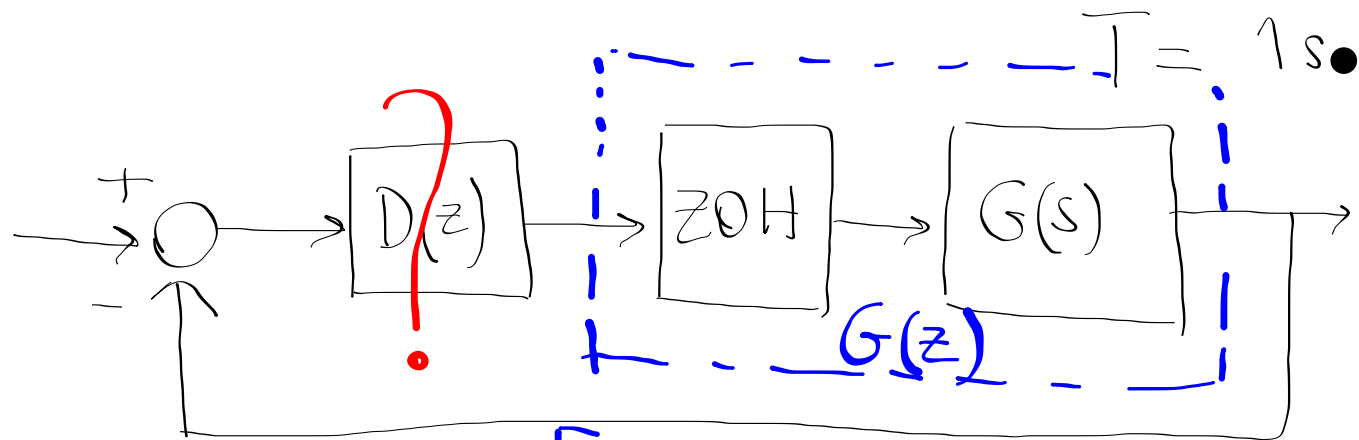


Metodo
diretto

$$G(s) = \frac{0.1}{s(s + 0.1)}$$



$$G(z) = \mathcal{Z} \left[\frac{1 - e^{-sT}}{s} G(s) \right] \quad (\text{HE})$$

$$z = e^{sT} \quad s=0 \Rightarrow z=1$$

$$z + 0.9672$$

$$G(z) = \frac{1}{(z-1)(z-0.9048)}$$

$z = e^{sT}$ $\Updownarrow$

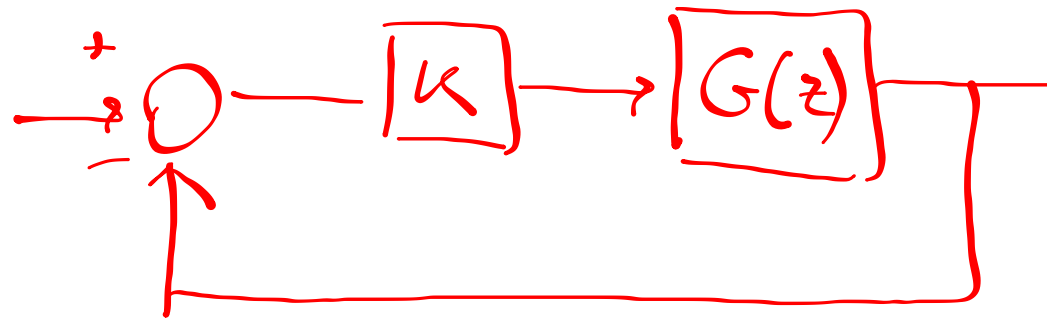
$$G(s) = \frac{0.1}{s(s+0.1)}$$

"sist. di tipo 1"

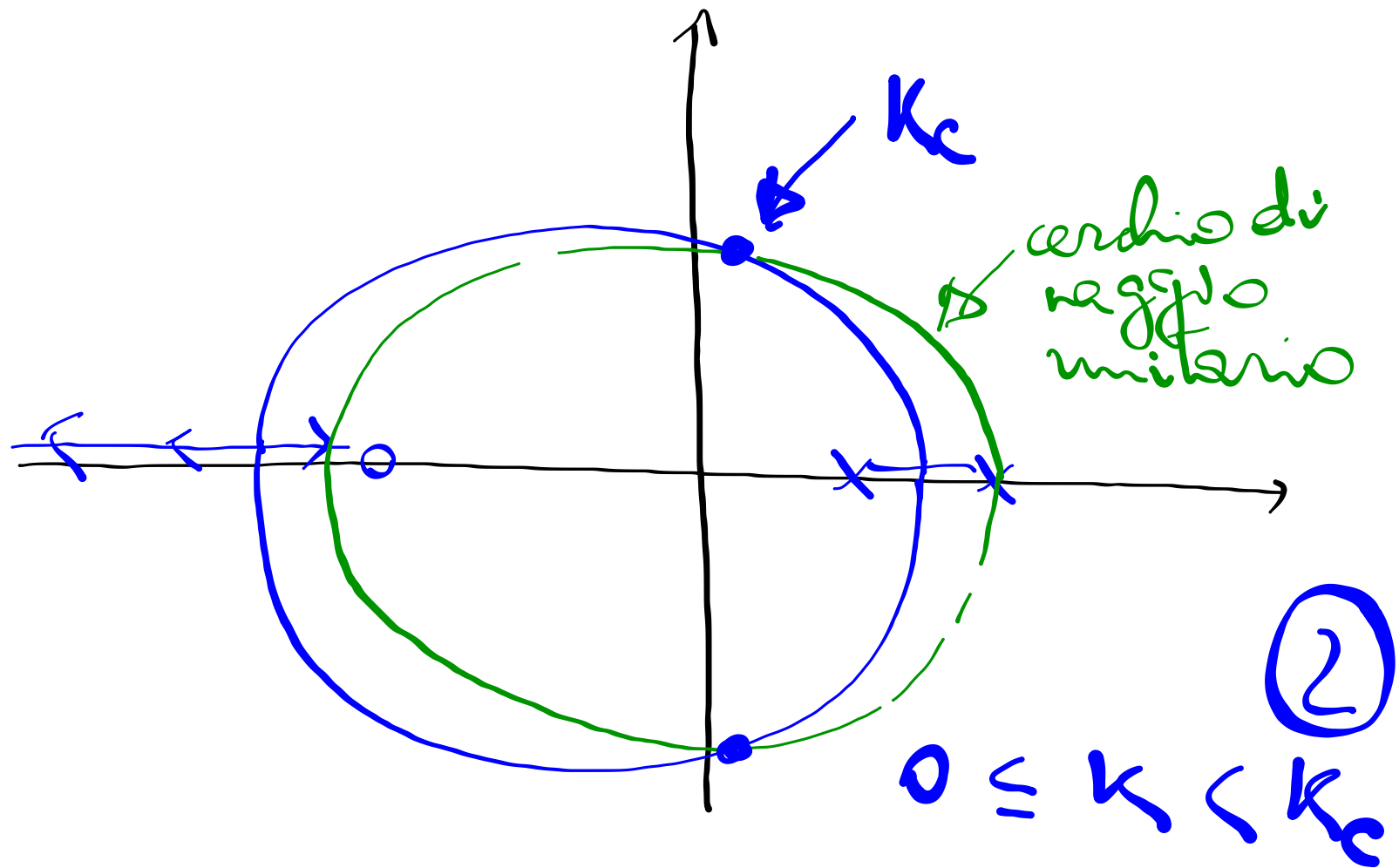
$$\begin{cases} S\% \leq 18\% \quad (\delta > 0.5) \\ T_a \leq 7s. \end{cases}$$

$$1) \quad D(z) \equiv \mathbb{R}$$

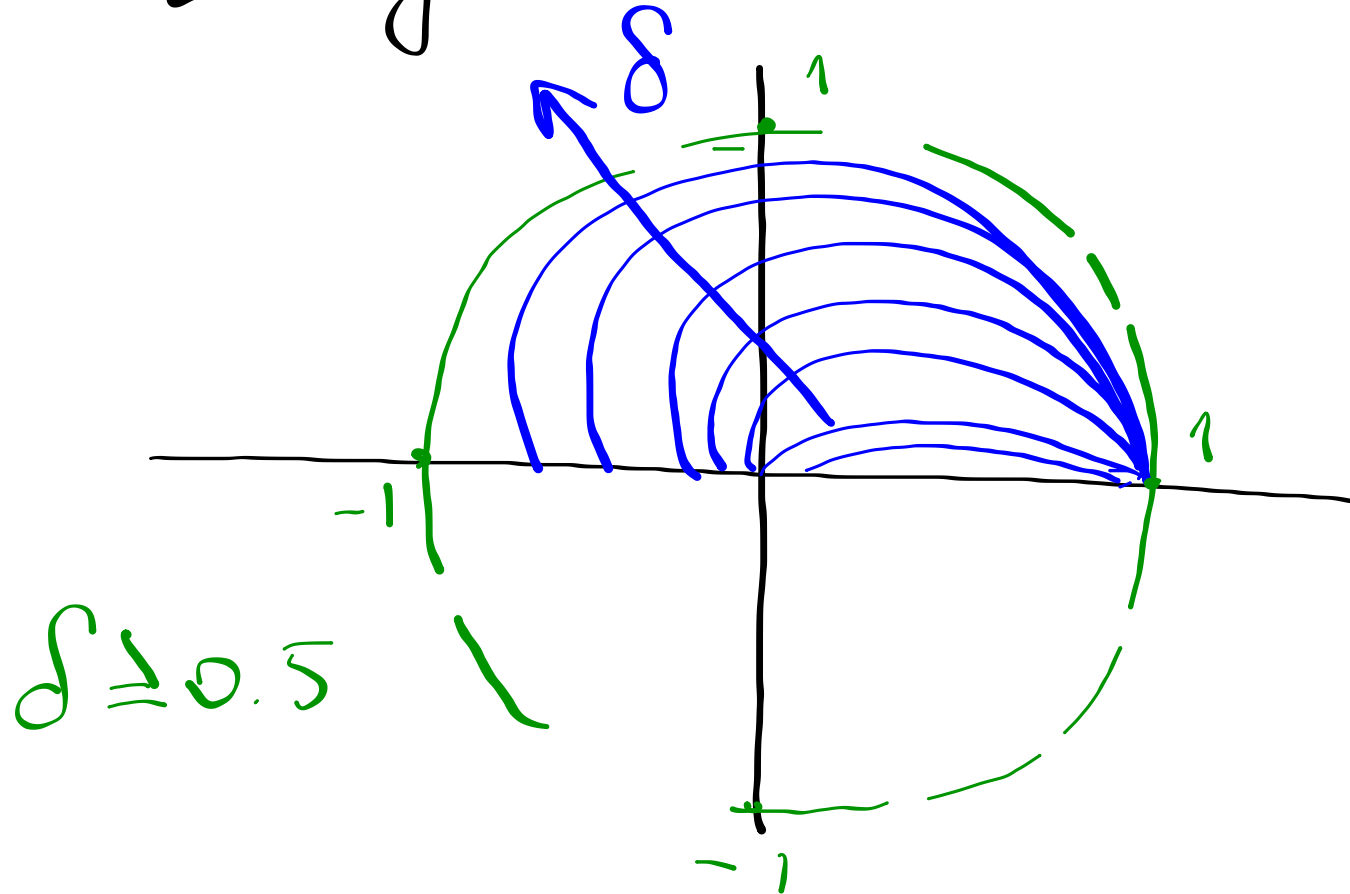
Progetto diretto con luogo
delle radici a tempo discreto



Variazioni delle radici di $1 + K G(z) = 0$
al variare di $K \geq 0$



Luoghi a δ costante



$$\begin{cases} \bar{T}_a = 84s \\ S\% = 14\% \end{cases}$$

$$\underline{\kappa = 0.08}$$

$$\begin{cases} \bar{T}_a = 7s \\ S\% \leq 18\% \end{cases}$$

$$\kappa \uparrow \Rightarrow \begin{matrix} \bar{T}_a \downarrow \\ \uparrow S\% \end{matrix}$$

1)

Rete correct rice

$$\bullet D_1(z) = K_1 \cdot \frac{z - 0.9048}{z - 0.4}$$

$$G_{a_1}(z) = \underbrace{D_1(z) \cdot G(z)}$$

$$K_1 = 2.89$$

$$\begin{cases} T_d = 13s & (< 7s.) \\ S\% = 16\% & (< 18\%) \end{cases}$$

$$K \uparrow \Rightarrow S\% \uparrow \quad T_d \downarrow$$

2) Rete

(-0.9048)

$$D_2(z) = k_2 \frac{z - 0.88}{z + 0.5} \quad (-0.4)$$

$$G_{a_2}(z) = D_2(z) \cdot G(z)$$

$$\begin{cases} T_a = 6.16 \text{ s. } (< 7 \text{ s}) \\ S\% = 21\% (< 18\%) \end{cases}$$

$$K_2 = 13.7184$$

$$K \downarrow \Rightarrow S\% \downarrow \quad T_a \uparrow$$

$$D_2(z) = 13 \frac{z - 0.88}{z + 0.5}$$

Cancelazionepolozero

$$G(z) = \frac{z + 0.9672}{(z-1)(z-0.9048)}$$

$$D_1(z) = \frac{z - 0.9048}{z - 0.4}$$

$$D_1(z) \cdot G(z) = \frac{z + 0.9672}{(z-1)(z-0.9048)} \cdot \frac{\cancel{z - 0.9048}}{z - 0.4}$$