Lecture 9

RGA and decoupling

Input: $[q_R, Q_1]$, Output $[T_T, T_B]$

A linearized model $\begin{bmatrix} T_T(s) \\ T_B(s) \end{bmatrix} = \begin{bmatrix} h_{11}(s) & h_{12}(s) \\ h_{21}(s) & h_{22}(s) \end{bmatrix} \begin{bmatrix} q_R(s) \\ Q_1(s) \end{bmatrix}$

$h_{11}(s) = \dfrac{-10}{1+100s}$, $h_{12}(s) = \dfrac{3}{(1+100s)(1+8s)}$

$h_{21}(s) = \dfrac{-11}{1+200s}$, $h_{22}(s) = \dfrac{10}{1+100s}$

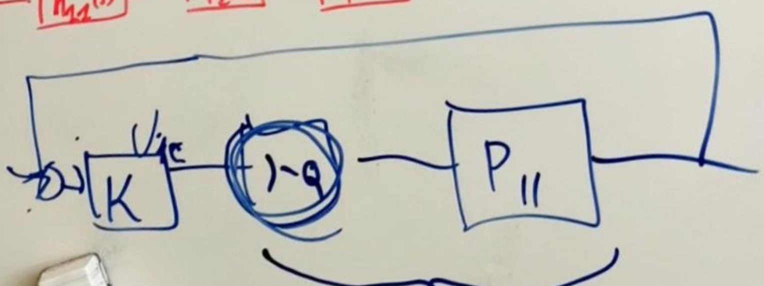
Best pairing by RGA

$$R = P(0) .* P(0)^{-T}, \quad P(0) = \begin{bmatrix} -10 & 3 \\ -11 & 10 \end{bmatrix}$$

$$= \begin{bmatrix} -10 & 3 \\ -11 & 10 \end{bmatrix} .* \begin{bmatrix} -0.15 & -0.16 \\ 0.045 & 0.15 \end{bmatrix}$$

$$= \begin{bmatrix} 1.5 & -1/2 \\ -1/2 & 1.5 \end{bmatrix}, \lambda = 1.5$$ There is no optimal pairing due to $\lambda = 1.5$

$\boxed{q_R(s)}$ — $\boxed{h_{11}(s)}$ — $\boxed{h_{12}(s)}$ — $\boxed{T_T(s)}$



Lav Bode og se at det er fint så man kan gange med 1 for k