



$$L_D \quad \frac{500K}{s^3 + 55s^2 + 250s + 500K} \rightarrow D(s) = [1 \ 55 \ 250 \ 500K]$$

$$\begin{array}{c|cc} s^3 & 1 & 250 \\ s^2 & 55 & 500K \\ s^1 & b_1 & 0 \\ s^0 & c_1 & \end{array} \quad b_1 = - \frac{\begin{vmatrix} 1 & 250 \\ 55 & 500K \end{vmatrix}}{55} = - \frac{(500K - 13150)}{55}$$

$$b_1 > 0 \therefore \frac{13150 - 500K}{55} > 0 \therefore$$

$$\therefore 13150 > 500K \therefore K < 27,5$$

$$c_1 = - \frac{\begin{vmatrix} 55 & 500K \\ b_1 & 0 \end{vmatrix}}{b_1} = - \frac{(-500K b_1)}{b_1} = 500K$$

$$c_1 > 0 \therefore 500K > 0 \therefore K > 0$$

Logo, o controlador  $K$ :  $0 < K < 27,5$