Computer Exercise 1
EL2520 Control Theory and Practice

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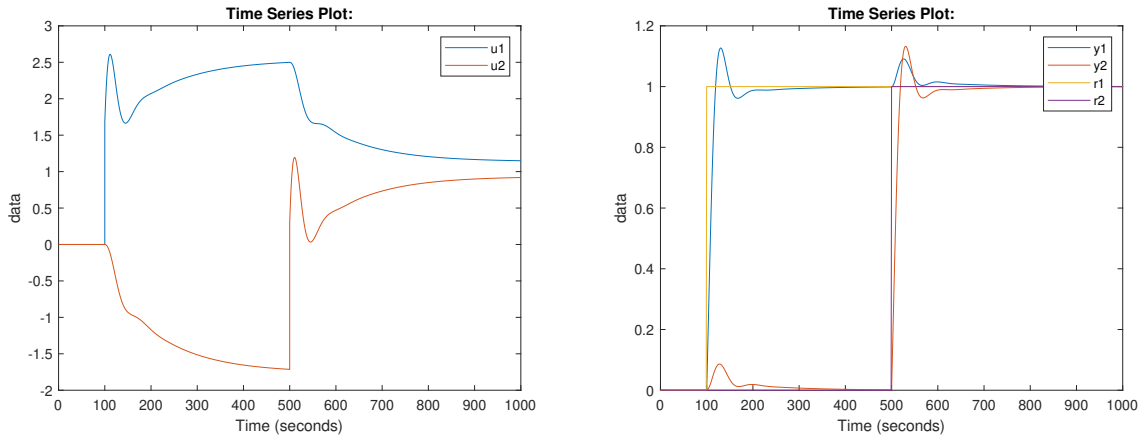
Minimum phase case

The controller is given by

$$F(s) = \begin{bmatrix} 1.6776(1 + \frac{1}{5.904s}) & 0 \\ 0 & 2.0137(1 + \frac{1}{6.391s}) \end{bmatrix}$$



(a) Response of the control signal u.

(b) Response of the output y with the reference r.

Figure 1: Simulink plots from exercise 3.2.3.

- Is the controller good?
  Yes, the controller is good.
- Are the output signals coupled?
  Yes, the output signals are coupled.

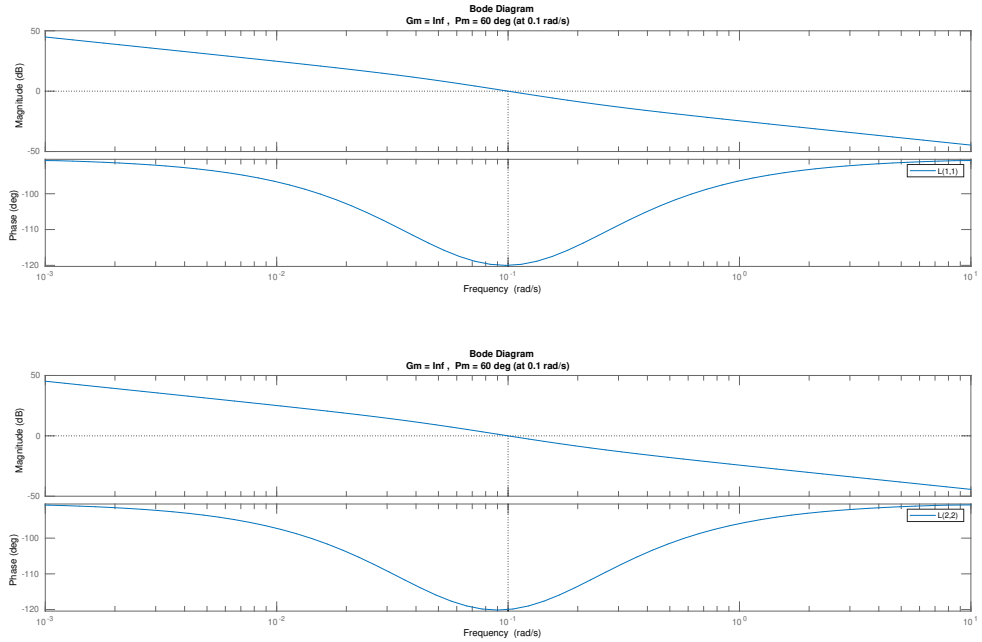
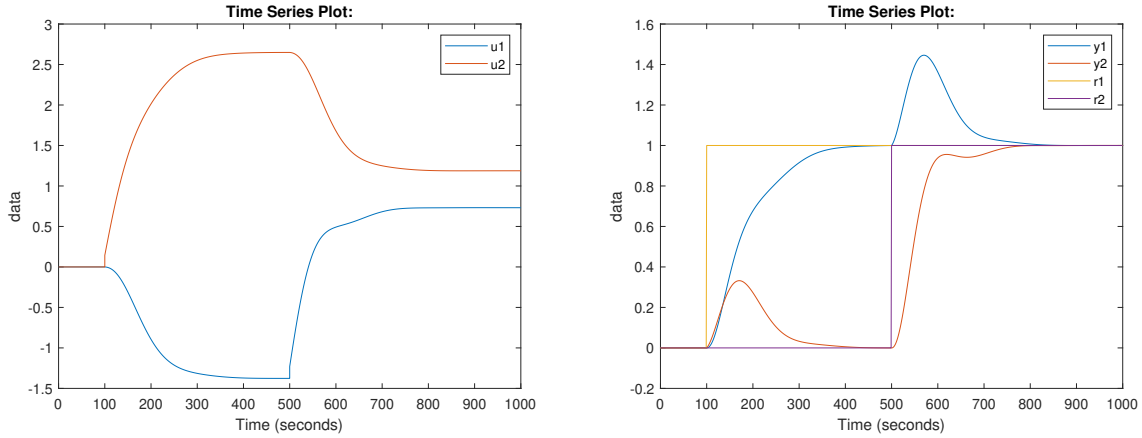


Figure 2: Bode diagram of the loop gain $L(s)$ from exercise 3.2.1.

Non-minimum phase case

The controller is given by

$$F(s) = \begin{bmatrix} 0 & 0.1469(1 + \frac{1}{3.9426s}) \\ 0.1437(1 + \frac{1}{4.8107s}) & 0 \end{bmatrix}$$



(a) Response of the control signal u.

(b) Response of the output y with the reference r.

Figure 3: Simulink plots from exercise 3.2.3.

- Is the controller good?

  Yes, the controller is good.

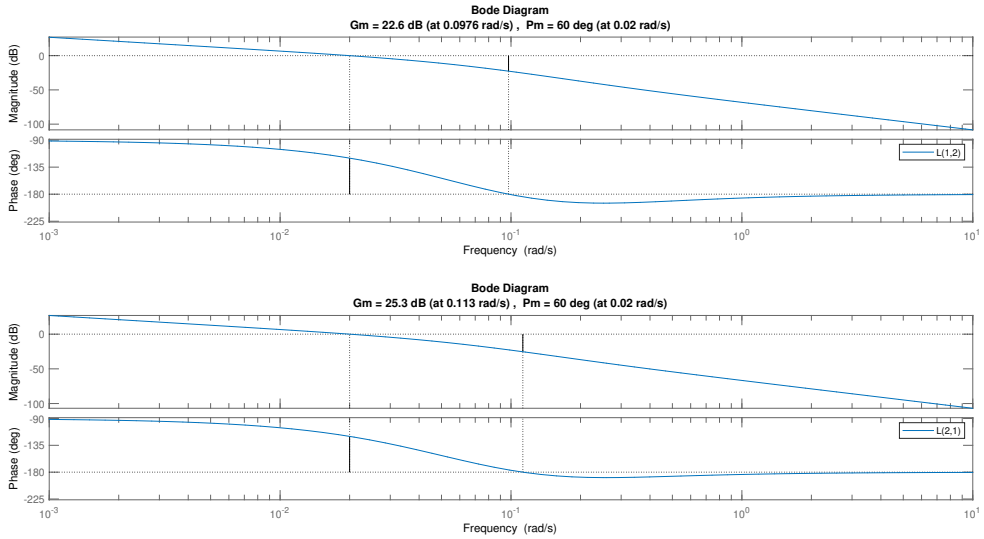


Figure 4: Bode diagram of the loop gain $L(s)$ from exercise 3.2.1.

- Are the output signals coupled?

  Yes, the output signals are coupled.