

Exercise Sheet 6: Smith Predictor**Problem 13:**

We now assume that the plant in Problem 11 has an additional delay of 0.5 time units. That is, we use

$$G(s) = \frac{3001(1 + s 109/3001)}{s^3 + 3s^2 + 3s + 1} e^{-0.5s}$$

1. Add the time delay to the feedback loop in Problem 11 **c**. Simulate a reference step response of $r = \sigma(t)$ and a disturbance step response of $F_Z = 0.05\sigma(t)$.
2. Now replace the controller by a Smith Predictor with $C(s)$ from 12 **b**. in Simulink.
3. Perform a reference step response of $r = \sigma(t)$ and a disturbance step response of $F_Z = 0.05\sigma(t)$.
4. Discuss the simulation results in **a**. and **c**.