Exercise Water Tank and PI regulator!

Download the notebook: ExtensionMOD300Vanntankbasisoppgave!

Do the following changes:

1] Include constraints such that the fluid level can never be larger than 4 meters and no less than 0 meters.

2] Change the flowrate from 0.0333 m3/s to 0.02 m3/s after 500 seconds. Then change the valve opening from 0.12 to 0.05 after 1250 seconds. Simulate and explain what happens.

3] From the simulation results, how can we argue that this is a nonlinear model?

Download the notebook PIVanntankMOD300

4] Study how the PI controller is implemented in the simulation code.

5) Explain what changes are taking place in the code with respect to time?

6] Why do you think we put a constraint on the valve opening.

7) Simulate and explain briefly the results.

8) Normally PI regulation will take place on real measured data. But here we use a simulator. But can we think of situations where it is beneficial to have a simulated version of the real process taking place and what role can a simulator have in this situation?