

Model Documentation of the 'Binary distillation tower Test and generate the linearized 82-state distillation column'

1 Nomenclature

1.1 Nomenclature for Model Equations

- x state vector
- u control input vector
- w noise vector
- z regulated output vector
- y measurement vector

2 Model Equations

State Vector and Input Vector:

$$x \in \mathbb{R}^{82} \quad u \in \mathbb{R}^4 \quad w \in \mathbb{R}^2 \quad z \in \mathbb{R}^4 \quad y \in \mathbb{R}^4$$

System Equations:

$$\dot{x}(t) = Ax(t) + B_1w(t) + Bu(t) \tag{1a}$$

$$z(t) = C_1x(t) + D_{11}w(t) + D_{12}u(t) \tag{1b}$$

$$y(t) = Cx(t) + D_{21}w(t) \tag{1c}$$

Outputs: z

3 Derivation and Explanation

This model is part of the "COMpleib" - library and was automatically imported into ACKREP.

The original description was:

BDT2 Binary distillation tower Test and generate the linearized 82-state distillation column "Multivariable feedback control Analysis and design" S. Skogestad and I. Postlethwaite John Wiley and Sons, 1996, Section 12.4 Note Matlab files <http://www.nt.ntnu.no/users/skoge/book/matlab.html> stored in /export/home/leibfr/Lipinski/matlab/...Examples_Multi_Feedback_Control/matlab_m/cola F. Leibfritz, 29.10.2003 save Dist_Column_82 A B B1 C C1 D12

4 Simulation

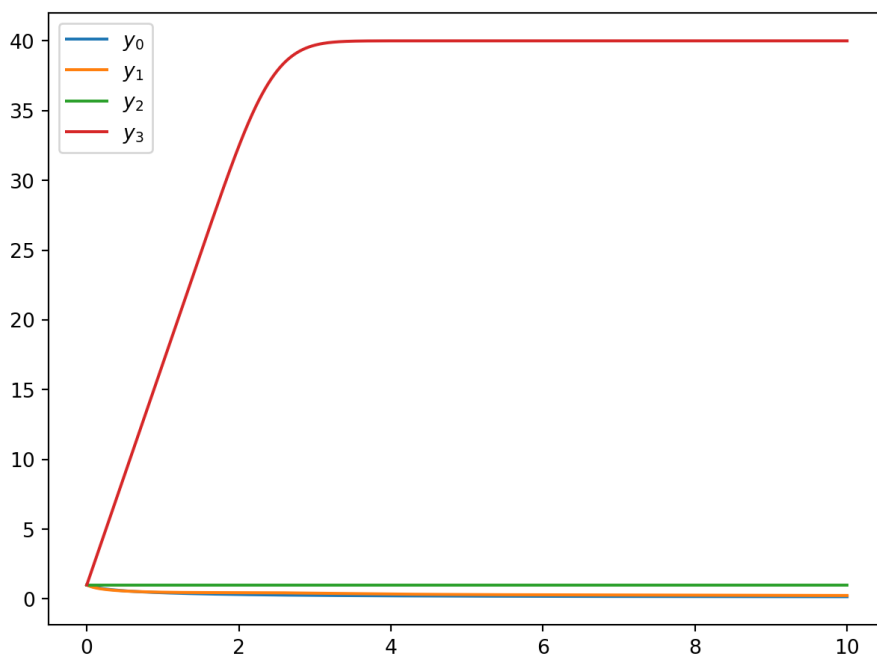


Figure 1: Simulation of the Binary distillation tower Test and generate the linearized 82-state distillation column.

References

- [1] "Multivariable feedback control Analysis and design" S. Skogestad and I. Postlethwaite John Wiley and Sons, 1996, Section 12.4