Model Documentation of the 'Heat flow in a thin rod 1D model'

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:

$$x \in \mathbb{R}^1 30u \qquad \in \mathbb{R}^1 w \in \mathbb{R}^1 z \qquad \in \mathbb{R}^2 y \in \mathbb{R}^2$$

System Equations:

$$\dot{x}(t) = Ax(t) + B_1 w(t) + Bu(t) \tag{1a}$$
$$z(t) = C_1 x(t) + D_{11} w(t) + D12u(t) \tag{1b}$$
$$y(t) = Cx(t) + D21w(t) \tag{1c}$$

Outputs: z

2.1 Exemplary parameter values

Parameters omitted due to large matrizes. See Source code.

3 Derivation and Explanation

This model is part of the "'COMPleib"' - library and wasautomatically imported into ACKREP.
The original description was:
HF1 Heat flow in a thin rod 1D model A. S. Hodel, K. P. Poolla and B. Tension, "Numerical Solution of the Lyapunpv Equation by Approximate Power Iteration", Linear Algebra Appl., Vol. 236, pp. 205-230, 1996

4 Simulation

References

[1] . S. Hodel, K. P. Poolla and B. Tension, "Numerical Solution of the Lyapunpv Equation by Approximate Power Iteration", Linear Algebra Appl., Vol. 236, pp. 205-230, 1996