

# Model Documentation of the 'Clamped beam model Los Angeles University Hospital SLICOT Working note 2002-2'

## 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:

$$x \in \mathbb{R}^{348} \quad u \in \mathbb{R}^1 \quad w \in \mathbb{R}^1 \quad z \in \mathbb{R}^2 \quad y \in \mathbb{R}^1$$

System Equations:

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

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

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

Outputs:  $z$

### 2.1 Exemplary parameter values

Parameters omitted due to large matrixes. See Source code.

## 3 Derivation and Explanation

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

The original description was:

CBM Clamped beam model Los Angeles University Hospital SLICOT Working note 2002-2 Y. Chahlaoui, P. Van Dooren -> Ex. 2.13 W. Draijer, M. Steinbuch, O.H. Bosgra and "A survey of model reduction methods for large-scale systems" A. C. Antoulas, D. C. Sorensen and S. Gugercin, 2000 -> Ex. 4.5

## 4 Simulation

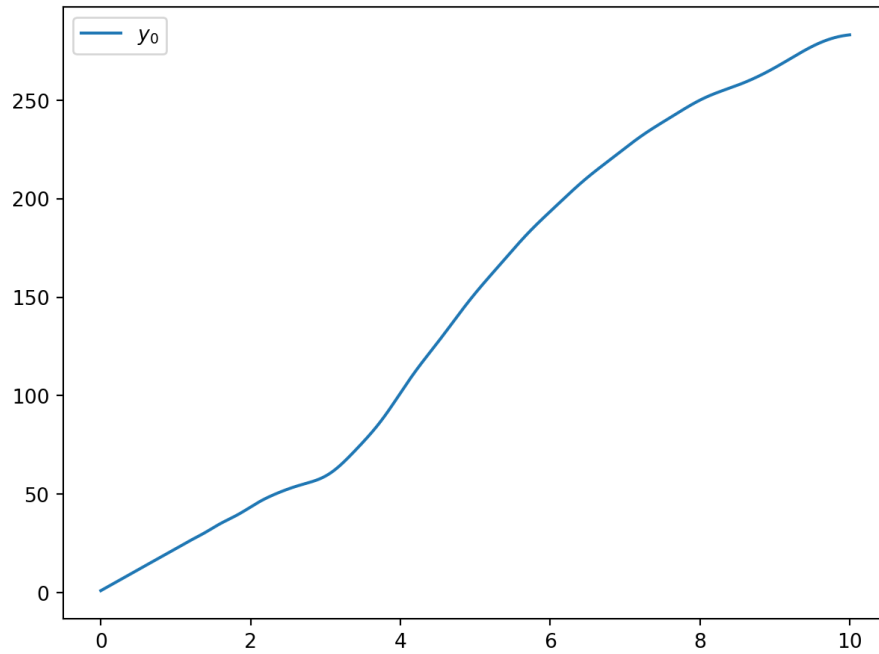


Figure 1: Simulation of the Clamped beam model Los Angeles University Hospital SLICOT Working note 2002-2.

## References

- [1] . Chahlaoui, P. Van Dooren – Ex. 2.13 W. Draijer, M. Steinbuch, O.H. Bosgra and "A survey of model reduction methods for large-scale systems" A. C. Antoulas, D. C. Sorensen and S. Gugercin, 2000 – Ex. 4.5