# Model Documentation of the 'International Space Station 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:

$$x \in \mathbb{R}^2 70u \qquad \in \mathbb{R}^3 w \in \mathbb{R}^1 z \qquad \in \mathbb{R}^2 73y \in \mathbb{R}^3$$

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:
ISS1 International Space Station SLICOT Working note 2002-2 Y. Chahlaoui, P. Van Dooren –> Ex. 2.11 W. Draijer, M. Steinbuch, O.H. Bosgra and "Approximation of the International Space Station 1R and 12A flex models", S. Gugercin, A. C. Antoulas and N. Bedrossian , 2001

# 4 Simulation

# References

[1] . Chahlaoui, P. Van Dooren –¿ Ex. 2.11 W. Draijer, M. Steinbuch, O.H. Bosgra and "Approximation of the International Space Station 1R and 12A flex models", S. Gugercin, A. C. Antoulas and N. Bedrossian , 2001