Model Documentation of the 'ASTOVL Aircraft'

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:

$$x \in \mathbb{R}^4 0u \qquad \in \mathbb{R}^3 w \in \mathbb{R}^4 z \qquad \in \mathbb{R}^1 1y \in \mathbb{R}^4$$

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

Symbol	Value					
	−314.26215	−158.24976	−34.0023935	−7.63343964	0	0
	512.0	0	0	0	0	0
	0	256.0	0	0	0	0
	0	0	128.0	0	0	0
	0	0	0	0	−314.26215	−158.24976
	0	0	0	0	512.0	0
	0	0	0	0	0	256.0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
A	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	−0.396668536	0.0435289262	−0.063611997	0	0
	0	0	0	0	0	−0.396668536
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0.396668536	−0.0435289262	0.063611997	0	0
	0	0	0	0	0	0.396668536
	0	0	0	0	0	0
	0	0	0	0	0	0

0	0	0
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0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
−0.000856241727	0.0559355396	−0.0357540528

3 Derivation and Explanation

This model is part of the "'COMPleib"' - library and wasautomatically imported into ACKREP.
The original description was:
AC14 ASTOVL Aircraft, LARGE model save ASTOVL_aug A B1 B2 C1 C2 D11 D12 D21 D22 Ag Bg Cg Dg in ASTOVL.m /export/home/leibfr/Lipinski/matlab

4 Simulation

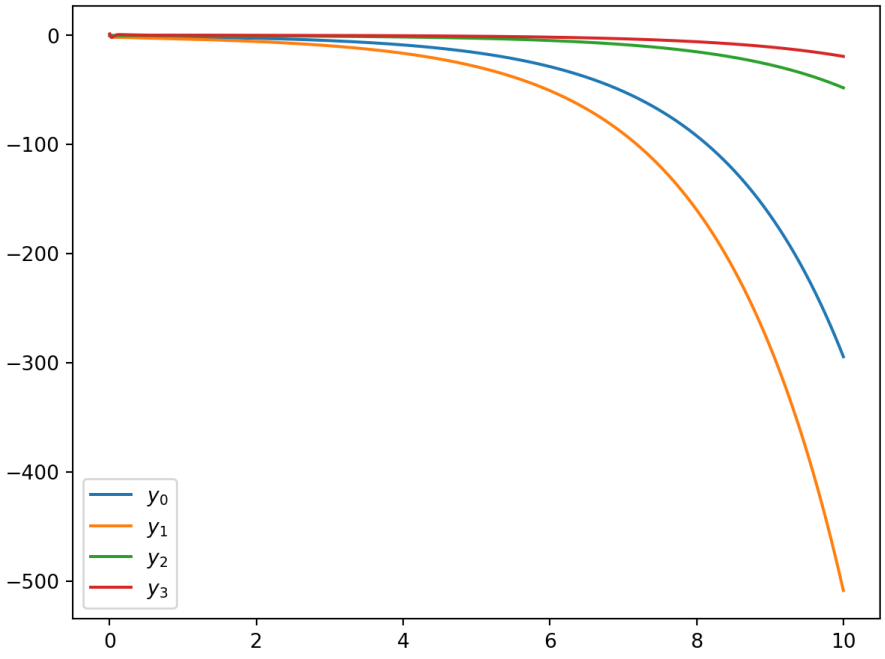

Figure 1: Simulation of the ASTOVL Aircraft.

References

[1] . Toffner-Clausen, "System Identification and Robust Control A Case Study Approach", Springer-Verlag, "Advances in Industrial Conrol", 1996 p. 274