Model description for the implementation of System Identification methodologies on the rotorcraft SH09

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March 7, 2018

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List of symbols

α	Angle of attack	[deg]

1 Introduction

Bibliography: [1], [2], [3], [4]

2 Model description

2.1 Model forces and moments coefficients

F matrix Forces:

$$X_u, X_v, X_w, X_p, X_q, X_r Y_u, Y_v, Y_w, Y_p, Y_q, Y_r Z_u, Z_v, Z_w, Z_p, Z_q, Z_r$$

Moments:

$$L_u, L_v, L_w, L_p, L_q, L_r M_u, M_v, M_w, M_p, M_q, M_r N_u, N_v, N_w, N_p, N_q, N_r$$

Controllability, **G** matrix: Forces

$$X_{\delta_{\text{lon}}}, X_{\delta_{\text{lat}}}, X_{\delta_{\text{ped}}}, X_{\delta_{\text{col}}} Y_{\delta_{\text{lon}}}, Y_{\delta_{\text{lat}}}, Y_{\delta_{\text{ped}}}, Y_{\delta_{\text{col}}} Z_{\delta_{\text{lon}}}, Z_{\delta_{\text{lat}}}, Z_{\delta_{\text{ped}}}, Z_{\delta_{\text{col}}}$$

Moments

$$M_{\delta_{\text{lon}}}, M_{\delta_{\text{lat}}}, M_{\delta_{\text{ped}}}, M_{\delta_{\text{col}}} N_{\delta_{\text{lon}}}, N_{\delta_{\text{lat}}}, N_{\delta_{\text{ped}}}, N_{\delta_{\text{col}}} N_{\delta_{\text{lon}}}, N_{\delta_{\text{lat}}}, N_{\delta_{\text{ped}}}, N_{\delta_{\text{col}}}$$

Time delays

$$\tau_{\text{lon}}, \tau_{\text{lat}}, \tau_{\text{ped}}, \tau_{\text{col}}$$

References

[1] V. Klein and E. A. Morelli, "Aircraft System Identification Theory and Practice," 2006.

[2] R. K. Remple and M. B. Tischler, *Aircraft and Rotorcraft System Identification.* 2006.

[3] G. Morelli and S. Derry, "System Identification Methods for Aerodynamic Modeling and Validation using Flight Data," 2011.

[4] G. Morelli, "Aircraft System Identification," 2011.