Uncertainty Modeling for Robustness Analysis of Control Upset Prevention and Recovery Systems

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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 34 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.Formal robustness analysis of aircraft control upset prevention and recovery systems could play an important role in their validation and ultimate certification. Such systems (developed for failure detection, identification, and reconfiguration, as well as upset recovery) need to be evaluated over broad regions of the flight envelope and under extreme flight conditions, and should include various sources of uncertainty. However, formulation of linear fractional transformation (LFT) models for representing system uncertainty can be very difficult for complex parameter-dependent systems. This paper describes a preliminary LFT modeling software tool which uses a matrix-based computational approach that can be directly applied to parametric uncertainty problems involving multivariate matrix polynomial dependencies. Several examples are presented (including an F-16 at an extreme flight condition, a missile model, and a generic example with numerous crossproduct terms), and comparisons are given with other LFT modeling tools that are currently available. The LFT modeling method and preliminary software tool presented in this paper are shown to compare favorably with these methods. This item ships from La Vergne,TN. Paperback.

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