

## **Performance Assessment of L1 Adaptive Augmentation Strategies for an Enhanced Longitudinal F16 Aircraft Model**

This paper presents a performance assessment of L1 Adaptive Controllers for a longitudinal F16 aircraft model in the context of a more realistic simulation model compared to the one used in [6]. Two different adaptive controllers are compared, which differ in the way, how they augment the combination of aircraft model and Differential PI (DPI) baseline controller. First of all, the effect of lower Flight Control System (FCS) sample rate on the performance is investigated. The aircraft model is enhanced by more sophisticated sensor models. Furthermore, the impact of atmospheric disturbances on the controller behavior is investigated by application of a Dryden Turbulence model. Finally, additional high frequency dynamics are added to the aircraft output channels. In spite of the additional disturbances, the adaptive controllers still ensure satisfying performance for the nominal aircraft and significant performance increase in case of uncertainty within the aircraft dynamics. This is shown in detail by means of one exemplary configuration of the enhanced simulation model and additional Monte Carlo simulations.