Modelling and Control of a Complex Multi-physic System

Case of Helicopter flight axis control

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***Abstract*— A helicopter flight axis control, which is a complex multi-physic system, is modelled using an energetic based graphical tool. Element of the system are mainly composed of passive technologies and their number tends to increase years after years to improve the pilots comfort by adding new functions. Thanks to the recent march in electronic fields and in order to simplify flight structures, new active systems have come out in aeronautical systems, a specific sector which requires extreme rigors and approved technology. In this paper, a simplified helicopter flight axis control is modelled with the intention of controlling the helicopter stick force feedback. Using the Energetic Macroscopic Representation the detailed methodology presented in this paper is helpful to determine an adequate control for active systems with sampled signals.**

Keywords-Energetic Macroscopic Representation; modelling; control; sampled signals; Naslin polynomial; Helicopter