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MODELLING AND CONTROL OF AN EFFORT FEEDBACK ACTUATOR IN HELICOPTER FLIGHT CONTROL USING ENERGETIC MACROSCOPIC REPRESENTATION

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ABSTRACT

In helicopter field, electromechanical devices controllers are usually designed and tuned from global analysis with transfer functions calculations. This leads to control architectures with a reduced number of controllers. Their regulating loops are usually global PID controllers where parameters are directly set up on dedicated test benches. Energetic representation tools such as Energetic Macroscopic Representation (EMR) aim at simplifying systems analysis and control providing model and control structuring method. In this paper, a simplified helicopter flight axis control is modelled with the intention of controlling the helicopter stick force feedback. Performances of both global PID and energetic model based inversion controllers are discussed through simulation results.

Keywords: causal inversion, model-based control, EMR