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Design and Analysis of Active Rocket Control Systems

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Abstract : The presented work regards a single-stage aerodynamically controlled solid propulsion rocket. Steering a rocket to fly along a predetermined trajectory can be beneficial for minimizing aerodynamic losses and achieved by implementing an active control system on board. In this particular case, a canard configuration has been chosen, although other methods of control have been considered and preemptively analyzed, including non-aerodynamic ones. The objective of this work is to create a system capable of guiding the rocket, focusing on roll stabilization. The paper describes initial analysis of the problem, covers the main challenges of missile guidance and presents data acquired during the experimental study.

Keywords : active canard control system, rocket design, numerical simulations, flight optimization
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