

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Poster Session (P)

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CEVHER - VERTICAL TAKE-OFF LANDING (VTOL) WITH COANDA EFFECT

Abstract

Vertical Take-Off Landing (VTOL) with Coanda Effect Unmanned Vehicle is using Coanda Effect to lift and be able to forward and backward flight. The vehicle design included an anti-torque system is used by fins and control algorithm. This makes CEVHER has more effective lift force than the other wing-based vehicles. In addition to that, the whole system is lighter weight and more stable. CEVHER will have an authentic software and innovative design as a vehicle. The main reason to make this kind of vehicle is to reduce human error, be able to make missions which cannot perform with human. CEVHER ensures to reduce the landing and take-off area and has various maneuver and observing ability. With using this kind of system in a vehicle, it provides extensive area to put a payload, satisfy the need for technical issues of transportation and communication. The payload can be modified with various sensors. The project procedure will be applied in the scope of ISO-9001 standards and ESA and NASA standards will be referenced of systems engineering and project management.

The system also has benefits of Coanda aerodynamics effect from unique vehicle body which will be design with Bezier Curves and optimized these curves to provide maximum lift. The body design provides payload area which doesn't has any disturbing effect to aerodynamics of the flight-payload-missions. The cruise efficiency and hover/observation efficiency comparison of Coanda, fixed wing, flapping wing and rotary wing shows that Coanda is the optimum design for the expected efficiencies in both flight phases of general flight mission. According to benchmarks, this system is more basic and applicable than the oriented jet system. Moreover, the advantages of system can be listed as more controllable, effective hover and lift performance, less vibration, more payload area and lightweight design. CEVHER has a protection system from hazardous condition (particles, dust etc.) of planets to protect payload if needs. CEVHER can be used as civil transportation, observation and exploration, GPS and communication, also scientific investigation and planetary transportation for materials.