

Airliner-UAV Flight Formation in Climb Regime

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Abstract : Extreme formation is a theoretical concept of self-sustain flight when a big Airliner is followed by a small UAV glider flying in airliner's wake vortex. The paper presents results of climb analysis with a goal to lift the gliding UAV to airliner's cruise altitude. Wake vortex models, the UAV drag polar and basic parameters and airliner's climb profile are introduced at first. Then, flight performance of the UAV in the wake vortex is evaluated by analytical methods. Time history of optimal distance between the airliner and the UAV during the climb is determined. The results are encouraging, therefore available UAV drag margin for electricity generation is figured out for different vortex models.

Keywords : flight in formation, self-sustained flight, UAV, wake vortex

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