

# Propeller wing aerodynamic interference for small UAVs during VSTOL

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## Abstract

The goal of the present investigation is to gain a better understanding, using numerical simulation, of the aerodynamic interference between propeller and wing during different flight phases of a VSTOL unmanned-aerial-vehicle (UAV). The proposed UAV investigated here, tilts part of the wings together with the propellers and nacelles, with each of the propellers located inboard between wing-tip and fuselage. The numerical method significantly reduces computational costs by coupling a Blade Element Momentum Theory propeller model with a solution of the Reynolds-Averaged Navier-Stokes equations. Calculations which will contribute to the design of the UAV are obtained. The simulations focus on the vertical take-off flight phase, the transitional flight phase and cruise/manoeuvres flight.

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