Numerical study of drag force on the uav tilt and fixed wing model during vertical take off landing

Muhammad Musyfiq Haikal, author

Abstrak

A hybrid vertical take-off landing (VTOL) UAV combines the concepts of fixed-wing and rotary-wing UAV aircraft in one platform while performing in both conventional and vertical take-off landings. This aircraft has a drawback of significant drag force generated due to fixed-wing. Therefore, a Tilt-Wing often utilized to overcome this obstacle whereby it could be adjusted to the vertical and horizontal directions. To enhance the understanding of generated drag force on both wing model, this study was performed by examine the drag characteristic of the VTOL UAV. The simulations were carried out in the wind speed range by 1.4 m/s, 4.17 m/s, and 6.94 m/s. Simulation results showed that the drag of the UAV Hybrid Tilt-Wing and Fixed-Wing increased at the speed of 1.4 m/s to 6.94 m/s while the highest drag value was 177.51 N on a Fixed-Wing UAV aircraft and 1.97 N on a Tilt-Wing UAV aircraft. The result concluded that Tilt-Wing UAV has less drag which was more efficient than fixed-wing.