

Aerodynamic Effects of Ice and Its Influences on Flight Characteristics of Low Speed Unmanned Aerial Vehicles

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Abstract : This paper presents the theory and application of low-speed flight for unmanned aerial vehicles when subjected to surface environmental conditions such as ice on the leading edge and upper surface. A model was developed and tested in a wind tunnel to see how theory compares with practice at various speed including take-off, landing and operational applications where head winds substantially alter parameters. Furthermore, a comparison is drawn with manned operations and how that this subject is currently under-supported with accurate theory or knowledge for designers or operators to make informed decision or accommodate individual applications. The effects of ice formation for lift and drag are determined for a range of different angles of attacks.

Keywords : aerodynamics, environmental influences, glide path ratio, unmanned vehicles

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