



Performance and Flowfield Measurements on a 10-inch Ducted Rotor VTOL UAV

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Performance and Flowfield Measurements on a 10-Inch Ducted Rotor Vtol Uav (Paperback)

By Preston Martin, Chee Tung

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.A ducted fan VTOL UAV with a 10-inch diameter rotor was tested in the US Army 7-by 10-Foot Wind Tunnel. The test conditions covered a range of angle of attack from 0 to 110 degrees to the freestream. The tunnel velocity was varied from 0 (simulating a hover condition) to 128 ft/sec in propeller mode. A six-component internal balance measured the aerodynamic loads for a range of model configurations, including the isolated rotor, the isolated duct, and the full configuration of the duct and rotor. For some conditions, hotwire velocity surveys were conducted along the inner and outer surface of the duct and across the downstream wake. In addition, fluorescent oil flow visualization allowed the flow separation patterns inside and outside of the duct to be mapped for a few test conditions. Two different duct shapes were tested to determine the performance effects of leading edge radius. For each duct, a range of rotor tip gap from 1 R to 4.5 R was tested to determine the performance penalty in hover and axial flight. Measured results are presented...



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