World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:9, No:12, 2015

A New Family of Flying Wing Low Reynolds Number Airfoils

Authors : Ciro Sobrinho Campolina Martins, Halison da Silva Pereira, Vitor Mainenti Leal Lopes

Abstract : Unmanned Aerial vehicles (UAVs) has been used in a wide range of applications, from precise agriculture monitoring for irrigation and fertilization to military attack missions. Long range performance is required for many of these applications. Tailless aircrafts are commonly used as long-range configurations and, due to its small amount of stability, the airfoil shape design of its wings plays a central role on the performance of the airplane. In this work, a new family of flying wing airfoils is designed for low Reynolds number flows, typical of small-middle UAVs. Camber, thickness and their maximum positions in the chord are variables used for the airfoil geometry optimization. Aerodynamic non-dimensional coefficients were obtained by the well-established Panel Method. High efficient airfoils with small pitch moment coefficient are obtained from the analysis described and its aerodynamic polars are plotted.

Keywords : airfoil design, flying wing, low Reynolds number, tailless aircraft, UAV
Conference Title : ICUAVG 2015 : International Conference on Unmanned Aerial Vehicles in Geomatics
Conference Location : Rome, Italy
Conference Dates : December 03-04, 2015

Open Science Index, Aerospace and Mechanical Engineering Vol:9, No:12, 2015 publications.waset.org/abstracts/33946/pdf