Airfoil Lift and Drag Extrapolation with Viterna and Montgomerie Methods

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Abstract

In order to compute the performance of a propeller blade using blade element momentum (BEM) method, the two-dimensional performance of the propeller airfoil in terms of lift and drag coefficients is necessary. Such data are usually available from model experiment for limited range of angle of attack (AoA). Therefore, it is necessary to extrapolate the limited data to cover whole range of AoA. The present study uses 2 (two) methods which are Viterna and Montgomerie methods in order to extrapolate the performance of an airfoil. The formulas and procedures of both methods are presented and their application are also demonstrated using an airfoil shape of NACA23012.

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Nomenclature

AR aspect ratio
CD drag coefficient
CL lift coefficient
f transformation function
t straight line function
α angle of attack