

SELECTED TOPICS In Aerospace Engineering

EDITOR

ERWIN SULAEMAN



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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APPLICATION OF THE AERODYNAMIC DISCRETE ELEMENT METHODS

29.1. Introduction

To implement the theoretical development of the present lifting surface methods, a FORTRAN computer code was developed. To evaluate the accuracy of the methods, a number of wing planforms are used and the results are compared with experimentation data or other lifting surface method results.

29.2. Delta Wing with AR=2

The first example is a delta wing with $AR = 2$ shown in Fig. 29.1. This wing planform has been selected by many to demonstrate their numerical procedures as shown in Table 29.1. Experimentation data is based on Wick [15]. The experimentation was performed in a steady flow with Mach number 0.13, and Reynolds number of 2.4 million. The results obtained using the present methods, shown in Table 29.1 and Figure 29.1, are in a good agreement with other lifting surface methods and experiments results. Note that the convergence rate of the present DPM result with respect to the number of panel element is slower than the present DLM.