**Examination of the details of 2D Vorticity Generation Around the Airfoil During Starting and Stopping Phasest**

**A.R. Wang1 and H.M. Blackburn2**

**1**Department of Mechanical and Aerospace Engineering

Monash University, Victoria 3800, Australia

2Department of Mechanical and AerospaceEngineering

Monash University, Victoria 3800, Australia

**Abstract**

This paper presents a numerical study of vorticity generation around a 2D airfoil in a impulsively started viscous flows (fast generation) and non-impulsively started viscous flows (slow generation). A single NACA0012 airfoil at an angle of attack 4 degrees was selected and the two-dimensional Navier-Stokes equations solved using a spectral element simulation code. A small range of Reynolds numbers from 1,000 to 50,000 was chosen and the two vorticity generation mechanisms, tangential pressure gradients (fluid side) and acceleration of the boundary (wall side), were analysed. I

**Themes:**

Aerodynamics, Computational fluid dynamics, Viscous Flows