

Numerical Investigation of Nonisothermal Reversed
Stagnation-point Flow

by

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Master of Science in Electromechanical Engineering



Faculty of Science and Technology
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A thesis submitted in partial fulfillment of the
requirements of the degree of

Master of Science in Electromechanical Engineering

Faculty of Science and Technology

University of Macau

2012

Approved by _____

Supervisor

Date _____

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Abstract

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Electromechanical Engineering

This thesis investigates the nature of the development of two-dimensional laminar nonisothermal flow of an incompressible fluid close to the reversed stagnation-point. Proudman and Johnson (1962) [1] first studied the flow and obtained an asymptotic solution by neglecting the viscous terms. This is not practice in neglecting the viscous terms within the total flow field. Viscous terms in this analysis are now included, and two-dimensional nonisothermal reversed stagnation-point flow is investigated by solving the Navier-Stokes equations coupled to energy equation.

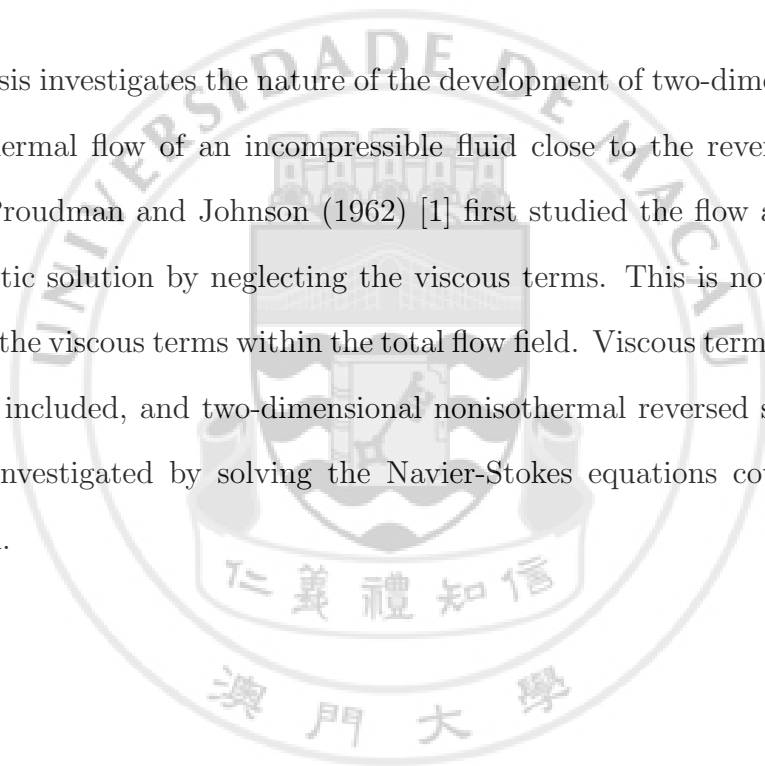


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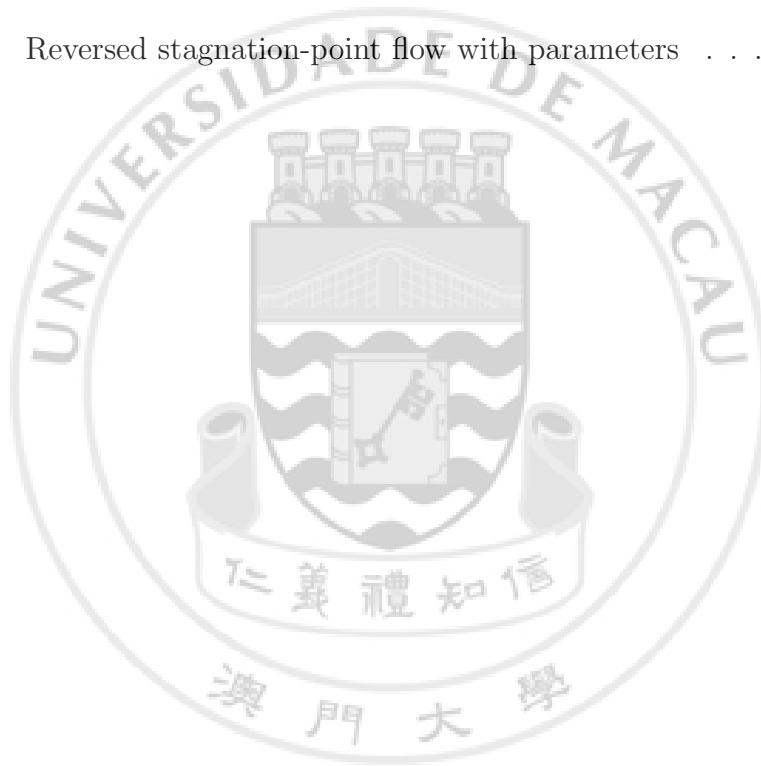
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LIST OF ABBREVIATIONS

CFD	C omputational F luid D ynamics
FEM	F inite E lement M ethod
FD	F inite D ifference
FV	F inite V olume
ODE	O rdinary D ifferential E quation
PDE	P artial D ifferential E quation

ρ	density
μ	dynamic viscosity
ν	kinematic viscosity
c_p	heat capacity
k	thermal conductivity