

# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Fluid Dynamics</b>	<b>3</b>
2.1	Definition of fluid . . . . .	3
2.2	Newtonian and non-Newtonian fluids . . . . .	3
2.3	Compressible and incompressible fluids . . . . .	3
2.4	Laminar and turbulent fluids . . . . .	3
2.5	Lagrangian and Eulerian approach . . . . .	3
<b>3</b>	<b>Governing equations</b>	<b>4</b>
3.1	Conservation of mass . . . . .	4
3.2	Conservation of momentum . . . . .	4
3.3	Conservation of energy . . . . .	4
<b>4</b>	<b>Computational Fluid Dynamics (CFD)</b>	<b>5</b>
4.1	What is the scope of CFD? . . . . .	5
4.2	Finite Difference Method (FDM) . . . . .	5
4.3	Finite Element Method (FEM) . . . . .	5
4.4	Finite Volume Method (FVM) . . . . .	5
<b>5</b>	<b>Lattice Boltzmann Method (LBM)</b>	<b>6</b>
<b>6</b>	<b>Application of FDM</b>	<b>7</b>
6.1	Parameters... . . . .	7
6.2	Results . . . . .	7
6.3	Code analysis . . . . .	7
<b>7</b>	<b>Application of FVM</b>	<b>8</b>

# Chapter 1

## Introduction

introduction about fluid dynamics and the navier stokes equations

Non-linearity of the navier stokes equations and some of the analytical solutions

computational fluid dynamics and introduction of the methods we are going to use

code and results

comparison and discussion

## Chapter 2

# Fluid Dynamics

2.1 Definition of fluid

2.2 Newtonian and non-Newtonian fluids

2.3 Compressible and incompressible fluids

2.4 Laminar and turbulent fluids

2.5 Lagrangian and Eulerian approach

## Chapter 3

# Governing equations

3.1 Conservation of mass

3.2 Conservation of momentum

3.3 Conservation of energy

## Chapter 4

# Computational Fluid Dynamics (CFD)

- 4.1 What is the scope of CFD?
- 4.2 Finite Difference Method (FDM)
- 4.3 Finite Element Method (FEM)
- 4.4 Finite Volume Method (FVM)

## Chapter 5

# Lattice Boltzmann Method (LBM)

## Chapter 6

# Application of FDM

6.1 Parameters...

6.2 Results

6.3 Code analysis

## Chapter 7

# Application of FVM