

CHAPTER I: INTRODUCTION TO TWO PHASE FLOWS	5
CHAPTER II: DEFINITIONS AND CLASSIFICATION OF THE DIFFERENT RÉGIMES OF TWO PHASE FLOWS	9
I : Density and mass fraction.....	10
II Relaxation time.....	12
III. Diluted and dense two phase flows.....	15
CHAPTER III: DIFFERENT APPROACHES FOR TWO PHASE FLOWS NUMERICAL SIMULATION.....	17
I. Gaseous phase numerical simulation :.....	18
RANS.....	22
LES.....	22
DNS	22
II. Two approaches for two phase flow modeling.....	23
CHAPTER IV: SPRAY FORMATION.....	27
I Combustion chamber and injection systems.....	28
II Primary and secondary liquid sheet beak up	33
ANNEX: droplet size,definitions, non dimensional numbers, différent injection systems	45
CHAPTER V: TURBULENT DISPERSION OF THE LIQUID PHASE	47
I. Drag coefficient of a spherical particle (or droplet)	48
II. Turbulent particles (or droplets) dispersion.....	52
CHAPTER VI: DROPLET EVAPORATION AND COMBUSTION	57
I. Evaporation model for an isolated droplet.....	58
II. Droplet-droplet interactions and muticomponent evaporation model.....	75
CHAPTER VII : DROPLET WALL INTERACTION.....	85
Droplet behavior on a hot wall.....	86
First classification (PhD C. Amiel SUPAERO)	90

Second classification (P. Villedieu [2,3]).....	90
CHAPTER VIII: EULER-LAGRANGE APPROACH, TWO WAY COUPLING	95
The Particle Source in Cell Model (PSICM) for Gas Droplet Flows	97
Basic Concept	97
Source terms	98
Droplet Trajectory in a turbulent flow	102
Lean premixer prevaporiser module [12, 16]	102
RECTANGULAR SECTOR [16,18]	103
REAL COMBUSTOR [16,19].....	103
NOMENCLATURE	114