

<b>1 Introduction</b>	<b>1</b>
1.1 Background .....	2
1.2 Motivation .....	7
1.3 Objectives .....	11
Chapter 1 bibliography .....	18
<b>2 State of the art</b>	<b>19</b>
2.1 Introduction .....	20
2.2 Turbocharger modelling .....	20
2.3 Turbocharging the SI engine by means of VGT .....	32
2.4 Background .....	33
2.5 Summary and conclusions .....	40
Chapter 2 bibliography .....	49
<b>3 Turbocharged 4-S SI ICE experimental and modelling activities</b>	<b>51</b>
3.1 Introduction .....	52
3.2 1-D Turbocharged ICE model obtention .....	55
3.3 Adiabatic TC maps methodology .....	86
3.4 Final turbocharged-engine model validation .....	107
Chapter 3 bibliography .....	135
<b>4 Turbocharged 4-S ICE analysis prospective modelling</b>	<b>137</b>
4.1 Introduction .....	138
4.2 Out-of-control experimental differences .....	139
4.3 Turbines comparison .....	150
4.4 VGT-SI Model usage for VVT optimization .....	165
4.5 Transient response .....	181
Chapter 4 bibliography .....	193
<b>5 Concluding remarks</b>	<b>195</b>
5.1 Introduction .....	196
5.2 Engine modelling .....	196
5.3 Turbocharger maps procedure .....	198
5.4 Complete SI-ICE model validation .....	199
5.5 Model usage for prospective analysis .....	200
5.6 Future works .....	202
<b>Global bibliography</b>	<b>207</b>