

Contents

Contents	xi
List of Figures	xiii
List of Tables	xx
1 Introduction	1
1.1 Introduction	2
1.2 Motivation and Objectives	5
1.3 Structure of the work	6
1.4 References	7
2 Fundamentals of the Fluid Structure Interaction	9
2.1 Introduction	13
2.2 Numerical Tools	17
2.3 Coupling Methodologies	24
2.4 Experimental Methodologies for Fluid Structure Interaction . . .	42
2.5 Summary and conclusions	51
2.6 References	53
3 Non-Dimensional characterization of Fluid Structure Interaction	65
3.1 Introduction	69
3.2 Problem Description	72
3.3 Non-Dimensionalization of the equations	74
3.4 Results	82
3.5 Interaction strength map	105
3.6 Summary and conclusions	108
3.7 References	110
4 Fluid Structure Interaction applied to vibroacoustics	115
4.1 Introduction	121
4.2 Application to vibroacoustics. Prediction of the Transmission Loss in a Flexible Chamber	130

CONTENTS

4.3	Prediction of Flow Induced Vibration of a flat plate located after a wall mounted obstacle. Aerovibroacoustics	162
4.4	Summary and conclusions	200
4.5	References	201
5	Conclusions and Future Works	209
5.1	Conclusions	210
5.2	Future Work	212
	Bibliography	213