

Contents

List of Symbols	xii
List of Figures	xiv
List of Tables	xix
Preface	xx
1 Introduction	1
1.1 Moving Boundary Problems	1
1.2 Basic Definition of Thermodynamic Variables	5
1.3 Classification of Moving Boundary Problems	11
1.4 Methods of Solution	19
1.5 Wavelets	26
1.6 Literature Survey on Moving Boundary Problems	33
1.7 Dimensionless Variables	38
2 Finite element Legendre wavelets Galerkin approach to inward solidification in simple body under most generalized boundary condition	40
2.1 Introduction	40
2.2 Formulation of Mathematical Model	42
2.3 Finite Element Legendre Wavelets Galerkin Method	45
2.4 Numerical Computation and Discussion	46
2.5 Conclusion	59

3	Wavelet Galerkin and wavelet collocation method in moving boundary problem with temperature dependent thermal physical properties	61
3.1	Introduction	61
3.2	Formulation of Mathematical Model	63
3.3	Wavelet Galerkin and wavelet Collocation Method	65
3.4	Convergence Analysis	69
3.5	Numerical Computation and Discussion	70
3.6	Conclusion	77
4	A mathematical model for solidification of binary eutectic system including relaxation time	79
4.1	Introduction	79
4.2	Formulation of Mathematical Model	82
4.3	Solution of the Problem	88
4.4	Numerical Computation and Discussion	94
4.5	Conclusion	108
5	Legendre Wavelets Modified Petrov-Galerkin Method in Two Dimensional Moving Boundary Problem	109
5.1	Introduction	109
5.2	Formulation of Mathematical Model	111
5.3	Legendre Wavelets Modified Petrov-Galerkin Method	113
5.4	Numerical Computation and Discussion	117
5.5	Conclusion	131
	Bibliography	132