

Contents

Chapter 1	: Introduction	
1.1	: A cursory look at basic concept of plasma	1
1.2	: Mathematical formulations for nonlinear wave propagation in plasmas	4
1.2.1	: Reductive perturbation approach	5
1.2.2	: Nonperturbative approach	11
1.3	: Multicomponent plasma	15
1.4	: Dusty plasma	16
1.5	: Rotating plasma	20
1.6	: Presentation of the thesis	22
Chapter 2	: Evolution of nonlinear ion-acoustic solitary wave propagation in rotating plasma	
2.1	: Introduction	26
2.2	: Basic equations and derivation of nonlinear wave equation	29
2.3	: Derivation of soliton solution	38
2.4	: Results and discussions	41

Chapter 3	: Salient features of solitary waves in dusty plasma under the influence of Coriolis force	
3.1	: Introduction	48
3.2	: Basic equations and derivation of nonlinear wave equation	50
3.3	: Derivation of soliton solution	58
3.4	: Results and discussions	62
Chapter 4	: Transient behaviour of ion-acoustic waves in magnetized plasma with negative ions	
4.1	: Introduction	70
4.2	: Basic equations and derivation of nonlinear wave equation	71
4.3	: Derivation of soliton solution	81
4.4	: Results and discussions	86
Chapter 5	: Evolution of double layers in rotating dusty plasmas with varying dust charged grains	
5.1	: Introduction	93
5.2	: Basic equations and derivation of Sagdeev potential equation	96
5.3	: Results and discussions	108
Chapter 6	: Conclusions and prologue to the future	115
	References	119
	List of Publications	128