## TABLE OF CONTENTS

Preface		iii
Intro	DUCTION	1
CHAPTER 1. BASIC CONCEPTS AND EQUATIONS		4
1.1	Closed linear systems	4
1.2	Coupling channels and open systems	7
1.3	Representation of input-interior and input-output trans-	
	formations	21
1.4	Examples	30
Снар	TER 2. RESOLUTION OF OPEN SYSTEMS	39
2.1	Combination of operator clusters	39
2.2	Kymological chains (from the Greek 'κυμα')	42
2.3	Reduction of the operator to triangular form and kymo-	
	logical resolution	49
2.4	Closure of coupling channels	54
2.5	Generalisation of the concept of kymological resolution	62
2.6	•.•	
	arbitrary point	66
Снар	TER 3. MODELS OF OPEN SYSTEMS	74
3.1	Diagonal of an open system	74
3.2	Equivalence of open systems	79
3.3	Synthesis of a stationary system from its transmission	
	operator	82
3.4	On a problem in the theory of spectral perturbation of	
	Hermitian operators. Ahiezer polynomials	96

## Table of Contents

3.5	Linearisation of the formula $E = \sqrt{(mc^2)^2 + (cp)^2}$ by means of the Cebysev matrices. Attempt at a physical inter-	
	pretation	105
Снарт	rer 4. Electrical networks	113
4.1	Multigraphs and electrical networks	113
4.2	The matrices $Z$ , $Y$ and $S$	118
4.3	The operator complex of a transmitting multipole	126
Снарт	TER 5. TRANSFORMATION OF OPEN SYSTEMS	139
5.1	Classes of systems. Change of basis in the coupling	
	channel space	139
5.2	Transformations $L_0$ , $L_1$ and $L_2$	142
5.3	An electrical model of a two-pole system and network	
	synthesis of four-poles	152
Снарт	rer 6. Systems with an infinite number of degrees of	
	FREEDOM	164
6.1	Problem of reflection at end-section of a two-conductor	•
	line	164
6.2	Infinite discrete chains	167
6.3	Unbounded operator complexes	17
6.4	Continuous chains	186
Снар	TER 7. WAVEGUIDES AND QUANTUM-MECHANICAL SCATTERING	ł
	THEORY	203
7.1	Preliminary remarks	203
7.2	Problem of reflection from non-uniformities in wave-	
	guides	208
7.3	Scattering of particles in a potential field	223
7.4	Compound nucleus in the scattering problem	230
Снар	rer 8. Non-stationary motion in open systems	240
8.1	Equation of evolution of an open system	240
8.2	Resolution of open systems for non-steady motion	24
8.3	Some properties of evolutionary equations	258
Ribi i	OCDADUV	260