

CONTENTS

CHAPTER I – SPECTRA

1.	Introduction	1
2.	Fourier Series and the Fourier Integral	4
3.	Spectra; Definition and Classification	9
4.	Spectral Theorems	11
5.	Running Spectra	18
6.	The Instantaneous Spectrum	21
7.	Spectra of Modulated Oscillations	24
8.	Spectrum Transfer	36
9.	Transformation of Spectra in Detection	42
10.	Spectrum of a Sum of Periodic Functions	48
11.	Spectra of Special Pulses	51
12.	Relation Between Pulse Duration and Width of Spectrum	62
13.	Relation Between the Spectra and Characteristics of a Linear System .	73
14.	Functions with Bounded Spectra	76
15.	Fourier Integral and Discrete Spectra	81

CHAPTER II – ANALYSIS

16.	Posing the Problem	85
17.	Spectral Instruments	87
18.	Simultaneous and Consecutive Analysis	89
19.	Static Resolving Power and Analyzer Error	91
20.	Analysis Without Resonators	99
21.	Resonator Operation	104
22.	Actual Operating Conditions of the Analyzer	107
23.	Relation Between Resolving Power of the Analyzer and Analysis Time	111
24.	Dynamic Resolving Power of a Resonator	115
25.	Dynamic Characteristic of a Resonator Under the Action of a Variable Frequency	124
26.	Analysis of Isolated Pulses	134

CHAPTER III — THE SPECTRA OF RANDOM PROCESSES

27.	Spectral Representation of Random Processes	147
28.	Spectra of Certain Stationary Processes	157
29.	Spectrum Concept as Applied to Nonstationary Processes	165
30.	Spectra of Some Nonstationary Processes	169
31.	Remark on the Analysis of Random Processes	185
32.	On the Shrinkage of a Spectrum	191

APPENDIXES

I.	On the Width of the Spectrum of a Product of Functions	198
II.	The Spectra of Certain Frequency-Modulated Oscillations	202
III.	Active Band of a Spectrum	208
IV.	Expansion of Spectra into the Spectra of Component Functions	210
V.	The Spectrum of a Short Pulse with Alternating Sign	213
VI.	Details of the Calculation of Δf and Δt	215
VII.	On a General Criterion for Determining Δf and Δt	218

Bibliography	220
--------------	-----

1