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| Autore | Khanin IAkov Izrailevich |
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| Nota di contenuto | About the Author; Contents; Preface; 1. Quantum Oscillators: General Considerations; 1.1. Principle of Operation and Practical Implementation; 1.2. Time-Dependent Processes in Quantum Oscillators; 2. Basic Equations for the Dynamical Behaviour of Lasers; 2.1. Equations for the Electromagnetic Field; 2.2. Equations for the Dynamics of the Material; 2.3. Self-Consistent Semiclassical Set of Laser Equations; 3. Single-Mode Lasers; 3.1. Dynamical Models of Homogeneously Broadened Lasers; 3.2. Traveling-Wave Laser with Homogeneous Active Medium; 3.3. Single-Mode Standing-Wave Class B Laser<br>3.4. Instabilities and Chaos in a Travelling-Wave Single-Mode Laser3.5. Dynamics of Three-Level Lasers with Coherent Pumping; 3.6. Effect of Inhomogeneous Broadening on the Laser Dynamic Characteristic; 4. Multimode Lasers with Frequency-Nondegenerate Modes; 4.1. Rate Equations Model with Spatial Mode Competition and Its Time Independent; 4.2. Relaxation Oscillations as Low Frequency Normal Laser Modes; 4.3. Time-Dependent Processes; 4.4. Combination Tone Mode-Mode Coupling and Its Influence on Laser Dynamics; 4.5. Inhomogeneously Broadened Solid-State Lasers<br>4.6. Dynamical Instability of Steady State of a Multimode Travelling- |

Wave Laser (Risken-Nummedal-Graham-Haken Theory)5. Multimode Lasers with Quasi- Frequency-Degenerate Modes; 5.1 Two-Mode Class B Laser with a Fabry-Perot Resonator; 5.2 Bidirectional Class B Laser; 5.3 Vector Model of a Fibre Laser; 6. Lasers with Time-Dependent Parameters; 6.1 Lasers with Periodic Parameter Modulation; 6.2 Monotonic Adiabatic Variation of Parameters; 6.3 Mechanisms of Undamped Pulsations in Solid-State Free- Running Lasers; 7. Lasers with Nonlinear Parameters; 7.1 Laser with an Opto-Electronic Feedback 7.2 Laser with a Nonlinear Absorber7.3 Laser with a Nonlinear Dielectric; 7.4 Passive Mode Locking in Lasers; 7.5 Processes in a Traveling Wave Laser with Saturable Absorber; 8. Giant Pulse Regime (Q-Switching); 8.1 Active - Q switching; 8.2 Giant Pulse Generation with Passive Q-switching; Supplement; Notations; Glossary; References

Sommario/riassunto

The book explores the current state of laser dynamics and provides reference data and basic experimental facts for old and new generation lasers. The most frequently used mathematical models are presented. The author discusses the reasons for spontaneous occurrence of pulsation of the intensity of the radiation of solid-state lasers, the influence of the nonstationary nature of parameters and non-linearity of laser elements on the generation characteristics. Special emphasis is placed on the problems of low-frequency dynamics of multimode lasers.