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5.4 Energy Loss Mechanisms5.5 Electron Dynamics in Plasmas; 5.6 Statistical Description of Electron Dynamics; 5.7 Bremsstrahlung Emission and Inverse Bremsstrahlung Absorption; 5.8 Charge Trapping in Small Objects; References; Chapter 6: Short X-Ray Pulses; 6.1 Characteristics of Short X-Ray Pulses; 6.2 Generating Short X-Ray Pulses; 6.3 Characterizing Short X-Ray Pulses; 6.4 Characteristic Time Scales in Matter; 6.5 Short-Pulse X-Ray-Matter Interaction Processes; 6.6 Single-Pulse X-Ray Optics; References; Chapter 7: High-Intensity Effects in the X-Ray Regime
7.1 Intensity and Electric Field of Intense X-Ray Sources7.2 High-X-Ray-Intensity Effects in Atoms; 7.3 Nonlinear Optics; 7.4 High-Intensity Effects in Plasmas; 7.5 High-Field Physics; References; Chapter 8: Dynamics of X-Ray-Irradiated Materials; 8.1 X-Ray-Matter Interaction Time Scales; 8.2 The Influence of X-Ray Heating on Absorption; 8.3 Thermodynamics of Phase Transformation; 8.4 Ablation; 8.5 Intensity Dependence of X-Ray-Matter Interaction; 8.6 X-Ray-Induced Mechanical Damage; 8.7 X-Ray Damage in Inertial Confinement Fusion; 8.8 X-Ray Damage in Semiconductors
8.9 Damage to Biomolecules in X-Ray ImagingReferences; Chapter 9: Simulation of X-Ray-Matter Interaction; 9.1 Models for Different Time- and Length Scales; 9.2 Atomistic Models; 9.3 Statistical Kinetics Models; 9.4 Hydrodynamic Models; References; Chapter 10: Examples of X-Ray-Matter Interaction; 10.1 Interaction of Intense X-Ray Radiation with Atoms and Molecules; 10.2 Interaction of Intense X-Ray Pulses with Atomic Clusters; 10.3 Biological Imaging; 10.4 X-Ray Scattering Diagnostics of Dense Plasmas; References; Index

Sommario/riassunto

"Filling the need for a book bridging the effect of matter on X-ray radiation and the interaction of x-rays with plasmas, this monograph provides comprehensive coverage of the topic. As such, it presents and explains such powerful new X-ray sources as X-ray free-electron lasers, as well as short pulse interactions with solids, clusters, molecules, and plasmas, and X-ray matter interactions as a diagnostic tool"--Back cover.

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