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Autore	Low Francis E. <1921-2007, >
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Nota di contenuto	CLASSICAL FIELD THEORY ELECTROMAGNETISM AND GRAVITATION; Contents; Preface; 1. Electrostatics; 1.1. Coulomb's Law; 1.2. Multipoles and Multipole Fields; 1.3. Energy and Stress in the Electrostatic Field; 1.4. Electrostatics in the Presence of Conductors: Solving for Electrostatic Configurations; 1.5. Systems of Conductors; 1.6. Electrostatic Fields in Matter; 1.7. Energy in a Dielectric Medium; Problems; 2. Steady Currents and Magnetostatics; 2.1. Steady Currents; 2.2. Magnetic Fields; 2.3. Magnetic Multipoles; 2.4. Magnetic Fields in Matter 2.5. Motional Electromotive Force and Electromagnetic Induction2.6. Magnetic Energy and Force; 2.7. Diamagnetism; Problems; 3. Time-Dependent Fields and Currents; 3.1. Maxwell's Equations; 3.2.

Electromagnetic Fields in Matter; 3.3. Momentum and Energy; 3.4. Polarizability and Absorption by Atomic Systems; 3.5. Free Fields in Isotropic Materials; 3.6. Reflection and Refraction; 3.7. Propagation in Anisotropic Media; 3.8. Helicity and Angular Momentum; Problems; 4. Radiation by Prescribed Sources; 4.1. Vector and Scalar Potentials; 4.2. Green's Functions for the Radiation Equation
4.3. Radiation from a Fixed Frequency Source4.4. Radiation by a Slowly Moving Point Particle; 4.5. Electric and Magnetic Dipole and Electric Quadrupole Radiation; 4.6. Fields of a Point Charge Moving at Constant High Velocity v: Equivalent Photons; 4.7. A Point Charge Moving with Arbitrary Velocity Less Than c: The Lienard-Wiechert Potentials; 4.8. Low-Frequency Bremsstrahlung; 4.9. Lienard-Wiechert Fields; 4.10. Cerenkov Radiation; Problems; 5. Scattering; 5.1. Scalar Field; 5.2. Green's Function for Massive Scalar Field; 5.3. Formulation of the Scattering Problem; 5.4. The Optical Theorem
5.5. Digression on Radial Wave Functions5.6. Partial Waves and Phase Shifts; 5.7. Electromagnetic Field Scattering; 5.8. The Optical Theorem for Light; 5.9. Perturbation Theory of Scattering; 5.10. Vector Multipoles; 5.11. Energy and Angular Momentum; 5.12. Multipole Scattering by a Dielectric; Problems; 6. Invariance and Special Relativity; 6.1. Invariance; 6.2. The Lorentz Transformation; 6.3. Lorentz Tensors; 6.4. Tensor Fields: Covariant Electrodynamics; 6.5. Equations of Motion for a Point Charge in an Electromagnetic Field; 6.6. Relativistic Conservation Laws; Problems
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8.6. Curvature

Sommario/riassunto

The author uses a unique approach which emphasizes the field theoretic aspects of gravitation and the strong analogies between gravitation and the other areas that are studied in physics. The theory-centered text begins with the simplest experimental facts then proceeds to the corresponding differential equations, theoretical constructs such as energy, momentum and stress and several applications. End-of-chapter problems provide students with an opportunity to test their understanding, serve as an introduction to and a review of material not included in the book and can be used to develop exam