

Lecture Notes for Feynman Lectures on Physics - Volume II

Emulie Chhor

June 5, 2021

Introduction

1 Chapter 1. Electromagnetism

- 1.1 1-1. Electrical forces
- 1.2 1-2. Electric and magnetic fields
- 1.3 1-3. Characteristics of vector fields
- 1.4 1-4. The laws of electromagnetism
- 1.5 1-5. What are the fields?
- 1.6 1-6. Electromagnetism in science and technology

2 Chapter 2. Differential Calculus of Vector Fields

- 2.1 2-1. Understanding physics
- 2.2 2-2. Scalar and vector fields— T and h
- 2.3 2-3. Derivatives of fields—the gradient
- 2.4 2-4. The operator ∇
- 2.5 2-5. Operations with ∇
- 2.6 2-6. The differential equation of heat flow
- 2.7 2-7. Second derivatives of vector fields
- 2.8 2-8. Pitfalls

3 Chapter 3. Vector Integral Calculus

- 3.1 3-1. Vector integrals; the line integral of $\nabla\psi$
- 3.2 3-2. The flux of a vector field
- 3.3 3-3. The flux from a cube; Gauss' theorem
- 3.4 3-4. Heat conduction; the diffusion equation
- 3.5 3-5. The circulation of a vector field
- 3.6 3-6. The circulation around a square; Stokes' theorem
- 3.7 3-7. Curl-free and divergence-free fields
- 3.8 3-8. Summary

4 Chapter 4. Electrostatics

- 4.1 4-1. Statics
- 4.2 4-2. Coulomb's law; superposition
- 4.3 4-3. Electric potential
- 4.4 4-4. $E = -\nabla\varphi$