



METADATA

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Abstract

This book has as its main objective the presentation of the basic principles of the classical theory of electromagnetism, in a relatively simple and short way, without expanding but focusing the reader's attention on the basic and essential points of the theory and its applications. Briefly about the subject of the book, we can say that initially the fundamental physical quantity of electric charge is described, followed by the consequences it brings to the surrounding space by creating an electric field and potential. The electric forces between charges are studied and the electric potential energy is defined. Also presented is the calculation of the electric field of symmetric non-point charges by applying Gauss's law. Then the concepts of capacitance, electric current and electric resistance are presented. Particular emphasis is placed on the presentation and analysis of electrical circuits with resistors and capacitors. In addition, magnetism

is presented with the description of magnetic induction and magnetic phenomena as well as the magnetic properties of matter. The electromagnetic forces and their applications are studied, while the phenomenon of electromagnetic induction in all its aspects (self-induction and mutual induction) is fully described. The book closes with the presentation of alternating currents and electromagnetic waves. It is worth noting that a representative number of questions and problems (not too large) follow each chapter to better assess the reader's acquired knowledge. It should also be mentioned that the mathematical background of the book lies in basic knowledge of vector and integral calculus at the undergraduate level. Particular emphasis is placed on the detailed presentation of mathematical operations, starting with the definitions of physical quantities and ending with the most complex relationships that describe electromagnetic phenomena.

