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Name of the book in EN: Technical Applications of Physics

Name of the book in CZE (original): Technické aplikace fyziky

Published: 2019

Key words: Physical laws; technical applications; energy; aerodynamic forces; thermodynamics of gases and vapors; electromagnetic induction; semiconductor components; lasers; electromagnetic waves and radiation; optical imaging; nuclear fusion; nuclear fission

Annotation: The two-volume book "Technical Applications of Physics" in 24 chapters systematically discusses the physical principles on which a wide range of technical systems, their implementation and functions are based. The book forms a bridge between the school subject Physics and technical fields. It is important for students and those interested in physics, as well as for technicians. It provides physics teachers with material to revive teaching. The book also pays attention to the history of physics and technology and uses numerous illustrations of technical systems for interpretation, incl. photographs of their design. The sequence of interpretation is followed in each chapter: first the applied laws of physics are reminded, then the technical implementation is described and the function of the systems is explained.

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Publisher: Gaudeamus, Univ Hradec Kralove

Categories / Classification:

Research Areas: Physical sciences

Web of Science Categories: natural sciences, astronomy, nuclear physics, optics

Document Information:

Document Type: Book

Language: Czech

ISBN: 978-80-7435-753-4

Summary: In the first two chapters, attention is paid to physics as a source of knowledge and the basis of applications developed by mathematics. The following chapters on interesting applications of Archimedes' law, on the wide application of flywheels and on heat transfer. The main focus of the first volume is on propulsion (internal combustion engines, water, steam and combustion turbines, rockets and electric motors). Attention is also paid to the production and transmission of electric current (collectively, these are electric induction machines). An important component of the interpretation is also the stability and movement of ships and flying machines (ie balloons, airships, aircraft and helicopters). The operation of technical systems is accompanied by dynamic phenomena, manifested by oscillations, which can cause dangerous destruction, as shown in a separate chapter. The chapters of the second volume discuss mainly the applications of semiconductors and electromagnetic waves / radiation. Besides it the systems for recording and reproduction of sound and image, lasers, communication and telecommunication technology and optical devices are discussed. Two chapters deal with nuclear fission, nuclear fusion and energy (hydro, coal and nuclear power plants). An attention is also paid to the physically correct use of the term energy. The last chapter briefly discusses technical museums and their motivation for studying physics.