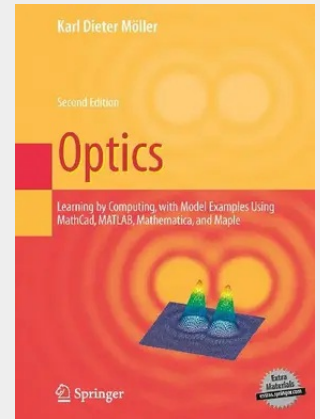


Optics

Learning by Computing, with Examples Using Maple, MathCad®, Matlab®, Mathematica®, and Maple®

This new edition is intended for a one semester course in optics for juniors and seniors in science and engineering. It uses scripts from Maple, MathCad, Mathematica, and MATLAB to provide a simulated laboratory where students can learn by exploration and discovery. The text covers all the standard topics of a traditional optics course. It contains step by step derivations of all basic formulas in geometrical, wave and Fourier optics. The basic text is supplemented by over 170 files, each suggesting programs to solve a particular problem, and each linked to a topic in or application of optics. The computer files are dynamic, allowing the reader to see instantly the effects of changing parameters in the equations. The book is written for the study of particular projects but can easily be adapted to other situations. The three fold arrangement of text, applications and files makes the book suitable for "self-learning".

The book is for readers who want to use model computational les for fast learning of the basics of optics. In the Second Edition, Matlab, Mathematica and Maples les have been added to the Mathcad les on the CD of the First Edition. The applications, given at the end of les to suggest different points of view on the subject, are extended to home work problems and are also on the CD of the Second Edition. While the book is suited well for self learning, it was written over several years for a one semester course in optics for juniors and seniors in science and engineering. The applications provide a simulated laboratory where students can learn by exploration and discovery instead of passive absorption. The text covers all the standard topics of a traditional optics course, including: geometrical optics and aberration, interference and diffraction, coherence, Maxwell's equations, wave guides and propagating modes, blackbody radiation, atomic emission and lasers, optical properties of materials, Fourier transforms and FT spectroscopy, image formation, and holography. It contains step by step derivations of all basic formulas in geometrical and wave optics.



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