



# OPTICAL DESIGN USING EXCEL®

Practical Calculations for  
Laser Optical System

HIRSHI KADAKOTA



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# Optical Design Using Excel Practical Calculations For Laser Optical Systems

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## **Optical Design Using Excel Practical Calculations For Laser Optical Systems:**

**Optical Design Using Excel** Hiroshi Nakajima, 2015-05-13 A practical introductory guide to optical design covering geometrical optics simple wave optics and diffraction using Excel software explains practical calculation methods for designing optical systems with fully worked out examples and avoiding complex mathematical methods includes practical calculations for ray tracing laser beam Gaussian beam focusing and diffraction calculations the ray tracing and the diffraction calculations are done by using the VBA program which Excel provides as a supporting tool describes basic optical theory and application methods and provides readers with calculation methods for designing laser optical systems with numerous practical calculation examples After finishing the book even inexperienced readers should have the ability to design laser optical systems covers large areas of geometrical optics and diffraction theory providing a good overview and reference for beginners or non specialist engineers accompanied by a website including password protected electronic files

Optical Design Using Excel Hiroshi Nakajima, 2015-08-10 A practical introductory guide to optical design covering geometrical optics simple wave optics and diffraction using Excel software explains practical calculation methods for designing optical systems with fully worked out examples and avoiding complex mathematical methods includes practical calculations for ray tracing laser beam Gaussian beam focusing and diffraction calculations the ray tracing and the diffraction calculations are done by using the VBA program which Excel provides as a supporting tool describes basic optical theory and application methods and provides readers with calculation methods for designing laser optical systems with numerous practical calculation examples After finishing the book even inexperienced readers should have the ability to design laser optical systems covers large areas of geometrical optics and diffraction theory providing a good overview and reference for beginners or non specialist engineers accompanied by a website including password protected electronic files

*CAD-Based Optical Design with Quadoa* Rafael G. González-Acuña, 2025-03-13 In CAD Based Optical Design with Quadoa we explore how optical design entails evaluating application requirements and creating optical systems specifically engineered to meet the exact needs of optical instruments This extensive system may include optics light sources sensors electronic boards display devices and other components Primarily optical design focuses on determining the shapes positions and materials of lenses and mirrors to ensure the optical system adheres to indicated criteria and specifications To meet specific requirements lens designers must use optical design software as an aid for their challenging task Most of the mentioned optical design programs are based on the idea of a spreadsheet that contains the information on each surface radius thickness materials and position among other parameters This paradigm has its positive aspects and negative aspects But optical design is a field under constant evolution and new ways to design optical systems are emerging In this book we are going to construct optimize and analyze optical systems under the fresh paradigm of Computer aided design CAD with the help of Quadoa Optical CAD a novel optical design software Within the chapters of the book we are going to see why this

paradigm can be very useful in designing optical systems in comparison with the one proposed by spreadsheets The purpose of this book is to teach optical design with a fresh and reliable tool Quadoa Optical CA This book mixes the classical books in optical design and a manual of Quadoa Optical CAD The purpose of this blend is to give readers enough knowledge to start a practical optical design with solid theory and robust tools in Quadoa Optical CAD     **The Software Encyclopedia** ,1988

*1965 Proceedings National Aerospace Electronics Conference* ,1965     **Dissertation Abstracts International** ,2003

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*Energy Research Abstracts* ,1989     *Annual Index/abstracts of SAE Technical Papers* ,1996     **Design of Laser Optical Systems** ,1992 This article gives basic rules associated with Gaussian beam transforms in optical systems It discusses optimum selections for system light passing aperture diameters and after researching Gaussian beam diameter system intercepts or truncations produces rules for diffraction transformations When designing laser optical systems it is necessary to study transformations associated with various types of optical instruments or systems with regard to Gaussian beams This is in order to find out the rules or patterns for transmission and transformation This is an important topic in the practical applications of lasers It is also a key question in the design of top quality laser systems     **Computer & Control Abstracts** ,1996     **Intermediate Optical Design** Michael J. Kidger,2004 This second volume based on Michael Kidger s popular short courses and workshops is aimed at readers already familiar with the concepts presented in Fundamental Optical Design SPIE Press Vol PM92 It begins with a sweeping discussion of optimization that is written with the user in mind and continues with a unique look at the role of higher order aberrations The book s key feature is its astounding presentation of a wide range of practical design examples covering such problems as secondary spectrum correction high numerical aperture designs lasers zoom lenses tilted or decentered optical systems and price and performance requirements Each scenario is accompanied by an in depth discussion that goes well beyond the ray aberration plot including useful insights into an optical designer s thought processes     **Optical Engineering Science** Stephen Rolt,2020-01-07 A practical guide for engineers and students that covers a wide range of optical design and optical metrology topics Optical Engineering Science offers a comprehensive and authoritative review of the science of optical engineering The book bridges the gap between the basic theoretical principles of classical optics and the practical application of optics in the commercial world Written by a noted expert in the field the book examines a range of practical topics that are related to optical design optical metrology and manufacturing The book fills a void in the literature by coving all three topics in a single volume Optical engineering science is at the foundation of the design of commercial optical systems such as mobile phone cameras and digital cameras as well as highly sophisticated instruments for commercial and research applications It spans the design

manufacture and testing of space or aerospace instrumentation to the optical sensor technology for environmental monitoring Optics engineering science has a wide variety of applications both commercial and research This important book Offers a comprehensive review of the topic of optical engineering Covers topics such as optical fibers waveguides aspheric surfaces Zernike polynomials polarisation birefringence and more Targets engineering professionals and students Filled with illustrative examples and mathematical equations Written for professional practitioners optical engineers optical designers optical systems engineers and students Optical Engineering Science offers an authoritative guide that covers the broad range of optical design and optical metrology topics and their applications Exploring Osaka David M. Dunfield,1993 A comprehensive English language guide to the city of Osaka for business travellers and tourists alike Second only to Tokyo as a banking and trade centre of Japan Osaka is a centre of tradition and culture as well the home of bunraku puppet theatre for example and is minutes by rail from Japan s ancient capitals of Kyoto and Nara A variety of suggested sightseeing itineraries are included as well as recommended museums restaurants and hotels a list of festival dates and sources of additional information **American Laboratory** ,2000 *A Course in Lens Design* Chris Velzel,2014-03-28 *A Course in Lens Design* is an instruction in the design of image forming optical systems It teaches how a satisfactory design can be obtained in a straightforward way Theory is limited to a minimum and used to support the practical design work The book introduces geometrical optics optical instruments and aberrations It gives a description of the process of lens design and of the strategies used in this process Half of its content is devoted to the design of sixteen types of lenses described in detail from beginning to end This book is different from most other books on lens design because it stresses the importance of the initial phases of the design process paraxial lay out and thin lens pre design The argument for this change of accent is that in these phases much information can be obtained about the properties of the lens to be designed This information can be used in later phases of the design This makes *A Course in Lens Design* a useful self study book and a suitable basis for an introductory course in lens design The mathematics mainly used is college algebra in a few sections calculus is applied The book could be used by students of engineering and technical physics and by engineers and scientists

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