

1. Record Nr.	UNINA9910300388703321
Autore	Lin Psang Dain
Titolo	New Computation Methods for Geometrical Optics / / by Psang Dain Lin
Pubbl/distr/stampa	Singapore : , : Springer Singapore : , : Imprint : Springer, , 2014
ISBN	981-4451-79-7
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (XII, 239 p. 134 illus., 33 illus. in color.)
Collana	Springer Series in Optical Sciences, , 0342-4111 ; ; 178
Disciplina	535.32
Soggetti	Optics Electrodynamics Microwaves Optical engineering Physics Quantum optics Lasers Photonics Classical Electrodynamics Microwaves, RF and Optical Engineering Numerical and Computational Physics, Simulation Quantum Optics Optics, Lasers, Photonics, Optical Devices
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Homogeneous coordinate notation -- Skew-Ray Tracing at Boundary Surfaces -- Modeling an Optical System -- Paraxial Optics for Axis-Symmetrical Systems -- The Jacobian Matrix of a Ray with respect to System Variable Vector -- Point Spread Function and Modulation Transfer Function -- Optical Path Length and Its Jacobian Matrix with respect to System Variable Vector -- The Wavefront Shape, Irradiance, and Caustic Surface in an Optical System.
Sommario/riassunto	This book employs homogeneous coordinate notation to compute the first- and second-order derivative matrices of various optical quantities. It will be one of the important mathematical tools for automatic optical design. The traditional geometrical optics is based on

raytracing only. It is very difficult, if possible, to compute the first- and second-order derivatives of a ray and optical path length with respect to system variables, since they are recursive functions. Consequently, current commercial software packages use a finite difference approximation methodology to estimate these derivatives for use in optical design and analysis. Furthermore, previous publications of geometrical optics use vector notation, which is comparatively awkward for computations for non-axially symmetrical systems.
