

1. Record Nr.	UNINA9910458723103321
Autore	Hariharan P
Titolo	Optical interferometry [[electronic resource] /] / by P. Hariharan
Pubbl/distr/stampa	Amsterdam ; ; Boston, : Academic Press, c2003
ISBN	1-280-96836-2 9786610968367 0-08-047364-4
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (368 p.)
Disciplina	535/.47/0287
Soggetti	Interferometry Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 309-342) and index.
Nota di contenuto	front cover; copyright; table of contents; front matter; Preface to the First Edition; Preface to the Second Edition; body; 1. Interferometry: Its Development; 1.1 The Wave Theory of Light; 1.2 The Michelson-Morley Experiment; 1.3 Measurement of the Metre; 1.4 Optical Testing; 1.5 Coherence; 1.6 Interference Spectroscopy; 1.7 The Laser; 1.8 Electronic Techniques; 1.9 Heterodyne Techniques; 1.10 Fiber Interferometers; 1.11 Nonlinear Interferometers; 1.12 Stellar Interferometry; 1.13 Space-Time and Gravitation; 1.14 Quantum Effects; 1.15 Future Directions; 2. Two-Beam Interference 2.1 Complex Representation of Light Waves 2.2 Interference of Two Monochromatic Waves; 2.3 Wavefront Division; 2.4 Amplitude Division; 2.5 Localization of Fringes; 2.6 Two-Beam Interferometers; 2.7 The Michelson Interferometer; 2.8 The Mach-Zehnder Interferometer; 2.9 The Sagnac Interferometer; 2.10 Interference with White Light; 2.11 Channeled Spectra; 2.12 Achromatic Fringes; 2.13 Standing Waves; 2.14 Interferential Color Photography; 3. Coherence; 3.1 Quasi-Monochromatic Light; 3.2 Waves and Wave Groups; 3.3 Phase Velocity and Group Velocity; 3.4 The Mutual Coherence Function 3.5 Spatial Coherence 3.6 Temporal Coherence; 3.7 Coherence Time and Coherence Length; 3.8 Coherence in the Space-Frequency Domain; 3.9 Nonclassical Light; 3.10 Effects in Two-Beam Interferometers; 3.11

Source-Size Effects; 3.12 Spectral Bandwidth Effects; 3.13 Spectral Changes Due to Coherence; 3.14 Polarization Effects; 4. Multiple-Beam Interference; 4.1 Fringes in a Plane-Parallel Plate; 4.2 Fringes by Reflection; 4.3 Fringes of Equal Thickness; 4.4 Fringes of Equal Chromatic Order; 4.5 Fringes of Superposition; 4.6 Three-Beam Fringes; 4.7 Double-Passed Fringes; 5. Lasers
5.1 Lasers for Interferometry; 5.2 Laser Modes; 5.3 Comparison of Laser Frequencies; 5.4 Frequency Stabilization; 5.5 Laser Beams; 6. Electronic Phase Measurements; 6.1 Photoelectric Settings; 6.2 Fringe Counting; 6.3 Heterodyne Interferometry; 6.4 Phase-Locked Interferometry; 6.5 Computer-Aided Fringe Analysis; 6.6 Phase-Shifting Interferometry; 6.7 Techniques of Phase Shifting; 6.8 Sinusoidal Phase Modulation; 7. Measurements of Length; 7.1 Line Standards; 7.2 End Standards; 7.3 The Integral Interference Order; 7.4 Exact Fractions; 7.5 The Refractive Index of Air
7.6 The International Prototype Metre; 7.7 The ⁸⁶Kr Standard; 7.8 Frequency Measurements; 7.9 The Definition of the Metre; 7.10 Length Measurements with Lasers; 7.11 Changes in Length; 7.12 Displacements; 7.13 Dynamic Angle Measurements; 8. Optical Testing; 8.1 The Fizeau Interferometer; 8.2 The Twyman-Green Interferometer; 8.3 Unequal-Path Interferometers; 8.4 Phase Unwrapping; 8.5 Analysis of Wavefront Aberrations; 8.6 Shearing Interferometers; 8.7 Grating Interferometers; 8.8 The Scatter-Plate Interferometer; 8.9 The Point-Diffraction Interferometer; 8.10 Computerized Test Methods
8.11 Aspheric Surfaces

Sommario/riassunto

When the first edition of "Optical Interferometry" was published, interferometry was regarded as a rather esoteric method of making measurements, largely confined to the laboratory. Today, however, besides its use in several fields of research, it has applications in fields as diverse as measurement of length and velocity, sensors for rotation, acceleration, vibration and electrical and magnetic fields, as well as in microscopy and nanotechnology. Most topics are discussed first at a level accessible to anyone with a basic knowledge of physical optics, then a more detailed treatm
