

CONTENTS

Preface

Chapter 1. Introduction to Diffractive Optics

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1.1	Functional capabilities of zoned diffractive optical elements	1
1.2	Zone fringes and phase functions of optical elements	7
1.2.1	Reduction of phase functions to the interval	7
1.2.2	Planar spherical lens	8
1.2.3	Planar cylindrical lens	11
1.2.4	Reflection zone plate	11
1.2.5	Planar prism	13
1.2.6	Combined and segmentized DOEs	14
1.3	Implementation of DOEs using digital holography methods	16
1.3.1	Fourier and Fresnel holograms	16
1.3.2	Amplitude holograms	18
1.3.3	Phase holograms	20
1.3.4	Combined holograms	23
1.3.5	Iterative approach to the design of holograms	23
1.4	Ray-tracing approach to the DOE design	27
1.4.1	Designing a DOE using ray-tracing optics	27
1.4.2	Deducing an inclinations equation for the design of DOEs	29
1.4.3	Designing a focusing DOE using geometric optics	31
1.4.4	Geometric-optical design of wave front compensators	34
1.5	Sampling and quantization of phase in diffractive optics	36
1.5.1	Model of sampling and quantizing the phase in the process of DOE fabrication	36
1.5.2	Estimating the error in sampling and quantizing the phase in a DOE plane	38
1.5.3	Influence of phase sampling and quantization on DOE characteristics	43
1.6	Computer-aided design of DOEs	48
1.6.1	Different approaches to the microrelief generation	50
1.6.2	Conducting real experiments in diffractive optics	50
	References	51

Chapter 2. Iterative methods for designing DOEs 55*Doskolovich L.L., Kotlyar V.V., and Soifer V.A.*

2.1	Introduction	55
2.2	Error-reduction algorithm	56
2.3	Input-output algorithm	59
2.4	Adaptive-additive algorithm	60
2.5	Adaptive-multiplicative algorithm	68
2.6	Adaptive-regularization algorithm	72
2.7	A gradient algorithm for computing a DOE phase	76
2.8	Application of iterative algorithms for designing DOEs	79
2.8.1	Design of DOEs focusing into radially symmetric domains of Fourier spectrum	80
2.8.2	Design of diffractive axicons generating axial light segments	83
2.8.3	Designing radially symmetric DOEs with quantized phase	88
2.8.4	Multiorde r binary-phase diffraction gratings	91
2.8.5	Multilevel phase diffraction gratings	98
2.8.6	Phase DOEs focusing into a spatial domain and onto the surface of a body of revolution	106
2.8.7	Focusing the Gaussian beam into a square	117
2.8.8	Focusing into a ring	125
2.8.9	Composite DOEs generating contour images	131
2.8.10	Quantized DOEs focusing onto a desired 2D domain	136
2.8.11	Quantized DOEs for generating amplitude-phase distributions	149
	References	153

Chapter 3. Design of DOE using electromagnetic theory 159*Doskolovich L.L., Golovashkin D.L., Kharitonov S.I., and Pavelyev V.S.*

3.1	Diffraction by reflection gratings with stepwise profile	160
3.1.1	TE-polarization	162
3.1.2	TM-polarization	165
3.2	Diffraction by continuous-profile reflection gratings	168
3.2.1	Rayleigh approximation	174
3.3	Diffraction by transmission dielectric gratings	177
3.3.1	TM-polarization	178
3.3.2	TE-polarization	187
3.4	Gradient techniques for solving the inverse problem of designing diffraction gratings	197
3.4.1	Designing reflection gratings with a stepwise profile	197
3.4.2	Designing dielectric binary gratings	200
3.4.3	Designing continuous-profile reflection gratings using the Rayleigh approximation	211

3.5	Diffraction by 2D reflection structures	215
3.5.1	Light diffraction by a curvilinear zone	215
3.5.2	Diffraction by a 2D reflection binary grating	222
3.5.3	Diffraction by 2D transmission dielectric structures	224
3.6	Gradient technique for synthesizing DOEs	233
3.7	Asymptotic analysis of diffraction by zoned structures	235
3.7.1	Solving the problem of diffraction by 1D DOEs using the scalar approximation	235
3.7.2	Solving the problem of diffraction by 1D DOEs using the electromagnetic approach	242
3.8	Modeling the electromagnetic radiation propagation using a method of finite differences	247
3.9	Analysis of electromagnetic impulse traveling through an antireflecting structure	258
	Conclusion	263
	References	264
Chapter 4. Technology of DOE fabrication		267
<i>Golovashkin D.L., Kazanskiy N.L., Pavelyev V. S., Soifer V.A., Solovyev V.S., Usplenyev G.V., and Volkov A.V.</i>		
4.1	Types of phase microreliefs and techniques for their fabrication	267
4.2	Fabricating DOEs using photolithography	271
4.2.1	Photomask fabrication	272
4.2.2	Exposure and development of photoresist films	279
4.2.3	Technology of DOE microrelief fabrication	281
4.3	DOE fabrication using e-beam lithography	290
4.3.1	Generation of pattern topology	293
4.3.2	DOE fabrication at the Institute of Applied Physics of Friedrich Schiller University (Jena, Germany)	294
4.4	Generation of a continuous microrelief	297
4.4.1	Techniques for generating a continuous microrelief	297
4.4.2	Mechanism of LPPC-based relief generation	299
4.4.3	Determination of an optimal optical density of photomask in the course of LPPC-based relief generation	302
4.4.4	Fabrication of test samples of visible-range optical elements	304
4.5	Etching technology	307
4.5.1	Use of the plasma-etching technology in the microrelief fabrication	308
4.6	Generation of diffractive microrelief by laser-aided structuring of diamond films	310
4.7	Replication of the DOE microrelief	323

4.8	Automation of experimental studies and technological tests of DOEs	325
4.8.1	Operations and equipment to control the process of DOE fabrication	325
4.8.2	Scanning probe microscope	327
4.8.3	Automation facilities for DOE testing	329
4.9	Examples of DOE synthesis and application of software complexes	332
4.9.1	Software in diffractive optics	332
4.9.2	Examples of DOE synthesis	336
	Conclusion	341
	References	341
Chapter 5. DOE for focusing the laser light		347
<i>Doskolovich L.L., Kazanskiy N.L., and Soifer V.A.</i>		
5.1	Introduction	347
5.2	Geometric optical calculation of DOEs focusing onto a line	348
5.3	Design and studies of geometric DOE	357
5.3.1	Diffraction lens	358
5.3.2	Diffraction cylindrical lens	364
5.3.3	DOE focusing onto a ring	366
5.3.4	DOE focusing onto a semi-ring	375
5.3.5	DOE focusing onto a transverse line-segment	377
5.3.6	Composite DOE to focus onto a cross	387
5.3.7	DOE focusing onto an axial segment	390
5.4	DOE focusing onto a 2D domain: A method of coordinated rectangles	395
5.5	Multifocus DOEs	401
5.5.1	Multifocus binary zone plates	408
5.5.2	DOEs with nonlinearly combined phases	414
5.6	Diffractive multifocus lenses	416
5.7	Two-order DOEs	422
5.8	Design of spectral DOEs	425
5.8.1	Color-separation gratings	425
5.8.2	Spectral DOE focusing onto an array of identical focal domains	427
5.8.3	Spectral DOE focusing onto various focal domains	430
5.8.4	Design of quantized spectral DOEs	431
	References	439
Chapter 6. Selection of laser light modes		445
<i>Pavelyev V.S. and Soifer V.A.</i>		
6.1	Laser light modes	445
6.1.1	Mode beams in the scalar approximation	445
6.1.2	Mode excitation in optical fibers and cavities	448

6.1.3	A complex eikonal method	450
6.1.4	Amplitude-phase relations for mode beams in free space	460
6.1.5	Gaussian and Bessel modes	460
6.2	Generation and selection of laser light modes using DOEs	467
6.2.1	Formulation of the problem of synthesizing DOEs matched to the laser modes	467
6.2.2	Methods to design phase modans	470
6.2.3	Designing unimode modans	470
6.2.4	Constructing an iterative procedure to design a unimode modan	473
6.2.5	Fast design of DOEs to form a desired unimode distribution of radial modes	476
6.2.6	Designing a DOE to form an array of laser modes	482
6.2.7	Setting up a multichannel communication line in a perfect lenslike medium with minimal energy losses	488
6.2.8	Design of a DOE intended to analyze the transverse-mode composition of coherent light beams	497
6.2.9	The results of the DOE-aided experimental studies of fundamental properties of the Gaussian modes	503
6.2.10	Experimental studies of the feasibility of multiplexing optical communication channels using selective Gauss-Hermite mode excitation	511
6.2.11	Designing DOEs matched to the modes of graded-index fibers with nonparabolic profile	515
6.3	Application of DOEs in systems for acquisition, transmission, and storage of data	517
6.3.1	Enhancement of data-carrying abilities of optical communication lines	517
6.3.2	Fiber-optic sensors	520
6.3.3	Experimental studies of a modan-aided microdisplacement sensor	522
6.3.4	Application of a DOE for collimating the semiconductor laser light	525
6.3.5	Diffraction beam splitters	526
	Conclusion	530
	References	531
Chapter 7. Light beams with periodic properties		535
<i>Khonina S.N., Kotlyar V.V., and Soifer V.A.</i>		
7.1	Introduction	535
7.2	Phase formers of light fields with longitudinal periodicity	541
7.3	An algorithm for designing a DOE generating rotating multimode Bessel beams	549
7.4	Generation of a couple of rotating diffraction-free beams using a binary-phase DOE	554

7.5	A DOE to generate multimode Gauss-Laguerre beams	559
7.6	Rotation of multimode GL light beams in free space and in a fiber	568
7.6.1	Free space	568
7.6.2	Graded-index fiber	571
7.7	Generation of rotating GL beams using binary-phase diffractive optics	574
7.8	Generalized Hermite beams in free space	581
7.9	Generation of Gauss-Hermite modes using binary DOEs	589
7.10	Self-reproduction of multimode GH beams	594
	Conclusion	601
	References	602
Chapter 8. Wave front correction		607
<i>Kazanskiy N.L., Kotlyar V.V., and Soifer V.A.</i>		
8.1	Problems of wave front generation	607
8.2	DOE-aided optical systems for the analysis of aspheric surfaces	608
8.3	Design of a planar compensator	611
8.4	Spectral properties of compensators	612
8.5	Accuracy characteristic of the reference wave front	614
8.6	The impact of the sampling and quantizing of the compensator's phase function on the reference wave front accuracy	618
8.7	Generation of wave fronts with small relative aperture	620
8.8	Axially symmetric compensators	622
8.9	Generation of higher-order wave fronts	626
8.10	Generation of axial-symmetry-free wave fronts	627
8.11	Generation of off-axis segments of rotation wave fronts	629
8.12	Generation of wave fronts with desired intensity distribution	634
8.13	Iterative algorithms for designing DOEs to generate desired phase distributions	639
8.14	Practical application	647
	References	648
Chapter 9. DOE-based lighting devices		651
<i>Kazanskiy N.L.</i>		
9.1	Prospects for use of diffractive optics in lighting devices	651
9.2	Design techniques for DOE-based lighting devices	652
9.3	Designing devices with multilevel DOEs	656
9.4	The results of studying a DOE-aided focusing device	657
9.5	Designing a DOE-based car headlamp	660
9.6	Designing coplanar illuminators	662
9.7	Results of testing DOE-based lighting devices	666
	Conclusion	670
	References	670

Chapter 10. Optical data processing using DOEs	673
<i>Khonina S.N., Kotlyar V.V., Skidanov R.V., and Soifer V.A.</i>	
10.1 Optical generation of image features	673
10.2 Expansion of the light field in terms of an orthogonal basis	675
10.2.1 Optimal Karhunen-Loeve basis	675
10.2.2 Use of the DOE for decomposing the field into the Hadamard basis	694
10.2.3 DOEs to decompose the field into angular harmonics	697
DOE to analyze the angular spectrum	700
10.2.4 DOEs to expand the field into the Zernike basis	704
10.3 Optical construction of the direction field and spatial frequency field	711
10.3.1 Optical fingerprint identification	721
10.3.2 Optical interferogram decoding	740
10.4 Optical implementation of the Hough-Radon transform	746
Conclusion	749
References	749
Index	755

The use of computers has revolutionized the DOE fabrication techniques. In the 1970s, computers were used to synthesize holograms of mathematically defined objects. As a result, the key problem of coding — writing the complex function in a physical medium and fabricating the corresponding amplitude-phase transparencies — was resolved. This provided an impetus to computer-aided synthesis of binary-amplitude phase and phase spatial filters, with photo-plotters used for writing the DOE in a physical medium. In the late 1980s, progress in microelectronics and laser machinery resulted in the advent of precision photo-plotters and e-beam lithographers, thus making the fabrication of DOEs with complex zone profile practically feasible. These advances have provided a wide range of activities for physicists, opticians, applied mathematicians, electronics and process engineers, and automatization specialists. DOEs with unique characteristics that are unattainable using the conventional optics were developed; for example, DOEs to focus the laser light and DOEs to select laser light modes called *modans*.

The book is constructed in such a manner that the basics of the subject may be derived from Chapter 1, while the following chapters may be read out of order according to the reader's personal professional preferences.

The book was written by the employees of Samara Image Processing Systems Institute of the Russian Academy of Sciences: Chapter 1 by V.A. Soifer; Chapter 2 by L.L. Doskolovich, V.V. Kotlyar, and V.A. Soifer; Chapter 3, Sections 3.1 to 3.4 by L.L. Doskolovich, Sections 3.5 to 3.7 by S.I. Kharitonov, Section 3.8 by D.L. Golovashkin, and Section 3.9 by D.L. Golovashkin and V.S. Pavelyev; Chapter 4 by A.V. Volkov, N.L. Kazanskiy, V.A. Soifer, and G.V. Usplenyev, with the exception of Section 4.4 by V.S. Solovyev and Section 4.6 by D.L. Golovashkin and V.S. Pavelyev; Chapter 5 by L.L. Doskolovich, N.L. Kazanskiy, and V.A. Soifer; Chapter 6 by V.S. Pavelyev and V.A. Soifer; Chapter 7 by V.V. Kotlyar, V.A. Soifer, and S.N. Khonina; Chapter 8 by N.L. Kazanskiy, V.V. Kotlyar, and V.A. Soifer;