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Transmission and Reflection Hologram in Two Steps; 4.3 Rainbow Hologram; 4.4 Double-Sided Hologram; 4.5 Fourier Hologram; 4.5.1 Principle; 4.5.2 Calculation; Problems; 5 Optical Properties of Holographic Images; 5.1 Hologram of an Object Point; 5.1.1 Image Equations; 5.1.2 Magnification; 5.1.3 Angular Magnification; 5.1.4 Longitudinal Magnification; 5.1.5 Image Aberrations; 5.2 Properties of the Light Source; 5.2.1 Spectral Bandwidth; 5.2.2 Image-Plane Holograms; 5.3 Image Luminance; 5.3.1 Without Pupil; 5.3.2 With Pupil 5.3.3 Image-Plane Holograms 5.4 Speckles; 5.4.1 Diffuser; 5.4.2 Resolution; 5.4.3 Incoherent Illumination; 5.4.4 Further Techniques; 5.5 Resolution; Problems; 6 Types of Holograms; 6.1 Introduction; 6.1.1 Transmission and Reflection Holograms; 6.1.2 Thick and Thin Holograms; 6.2 Thin Holograms; 6.2.1 Thin Amplitude Holograms; 6.2.2 Thin Phase Holograms; 6.3 Volume Holograms; 6.3.1 Theory of Coupled Waves; 6.3.2 Phase Holograms; 6.3.3 Amplitude Holograms; 6.3.4 Comparison of Diffraction Efficiency; 6.3.5 Distinction Criteria for Holograms; Problems; Part 2 Basic Experiments
7 Optical Systems and Lasers for Holography 7.1 Coherence and Interferometers; 7.1.1 Coherence; 7.1.2 Spatial Coherence; 7.1.3 Temporal Coherence; 7.2 Modes and Coherence; 7.2.1 Gaussian Beam; 7.2.2 Longitudinal Modes; 7.2.3 Coherence Length; 7.2.4 Etalon; 7.3 Gas Lasers for Holography; 7.3.1 He-Ne Laser; 7.3.2 Ion Laser; 7.3.3 He-Cd Laser; 7.4 Solid-State Lasers for Holography; 7.4.1 Ruby Laser; 7.4.2 Nd:YAG Laser; 7.5 Lenses and Spatial Filters; 7.5.1 Gaussian Beam; 7.5.2 Focusing; 7.5.3 Geometrical Optics; 7.5.4 Spatial Filters; 7.5.5 Beam Expansion; 7.6 Polarizers and Beam Splitters
7.6.1 Polarization

Sommario/riassunto

From fundamentals to advanced experiments and applications, this book explains how holography works. It guides students from simple optics to advanced topics in holography, following a practical approach using real-world materials. This proven university textbook contains exercises plus solutions as well as instructions for more than 20 experiments.
