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Elements; 3.2.2 Spherical Refractive X-ray Lenses; 3.2.3 Parabolic Compound Refractive Lenses (CRL); 3.2.4 Kinoform Lenses; 3.2.5 Characteristics of the Refractive Lenses; 3.3 X-ray Mirrors. Reflection of X-rays at Surfaces; 3.3.1 Reflective X-ray Optics (Kirkpatrick-Baez Mirrors); 3.3.2 Capillaries; 3.3.3 Waveguides (Resonators); 3.3.4 Other Reflective Optical Elements; 3.4 Diffraction X-ray Optics; 3.4.1 Fresnel Zone Plates; 3.4.2 Hologram of a Point Object; 3.4.3 Quantities Characterizing a Binary Zone Plate
3.4.4 Multilevel Zone Plate 3.4.5 Getting a Clean and Intense Focused Beam with ZPs; 3.4.6 Bragg-Fresnel Lenses; 3.4.7 Multilayer Laue Lenses; 3.4.8 Photon Sieves; 3.4.9 Beam Compressors; 3.5 Other X-ray Optics; 3.6 Measuring the Size of the X-ray Focused Spot; 3.7 Conclusion; 4 Scattering Experiments Using Nanobeams; 4.1 From the Ensemble Average Approach towards the Single Nanostructure Study; 4.1.1 A Motivation for the Use of Small X-ray Beams; 4.1.2 Required Focused Beam Properties; 4.2 Scanning X-ray Diffraction Microscopy; 4.3 Finite Element Based Analysis of Diffraction Data
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5.5 Detectors: Pixel and Time Resolution, Dynamical Range

Sommario/riassunto

A comprehensive overview of the possibilities and potential of X-ray scattering using nanofocused beams for probing matter at the nanoscale, including guidance on the design of nanobeam experiments. The monograph discusses various sources, including free electron lasers, synchrotron radiation and other portable and non-portable X-ray sources.For scientists using synchrotron radiation or students and scientists with a background in X-ray scattering methods in general.