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Title

Demonstration of an EUV Phase-only Computer-generated Hologram

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As the development of extreme ultraviolet (EUV) lithography progresses, interest grows in the extension of traditional optical components to the EUV regime. The strong absorption of EUV by most materials and its extremely short wavelength, however, makes it very difficult to implement many components that are commonplace in the longer wavelength regimes. One such component is the diffractive optical element used, for example, in illumination systems to efficiently generate modified pupil fills. Here we demonstrate the fabrication and characterization of an EUV binary phase-only computer-generated hologram allowing arbitrary far-field diffraction patterns to be generated. Based on reflective architecture, the fabricated device is extremely efficient. In the case where axially symmetric diffraction patterns are desired (such as dipole or quadrupole) both positive and negative diffraction orders can be used and the efficiency can be twice as high.