

Development of XUV multilayer coatings in IOF

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Abstract

High-reflective XUV coatings are a key component for many applications including microscopy in the "water window" (2.3 - 4.4 nm), next generation lithography ($\lambda = 13.5$ nm), high-order harmonic generation (20 - 50 nm), astronomy and spectroscopy (5 - 80 nm) as well as plasma diagnostics and laser research.

At the Fraunhofer IOF Jena multilayer coating development covers the full spectral range from 1.0 nm to vacuum ultraviolet around 200 nm. This paper covers some theoretical design considerations, prospects of modern interface-engineered strategies (interface barriers and capping layers) and deposition techniques for controlled fabrication of XUV multilayer coatings. The paper summarizes our recent progress in preparation of high-reflective multilayer coatings with regard to minimum structure imperfections, enhanced stability and different possibilities in broadening of the angular reflective response.