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EUV Optical Elements with Enhanced Spectral Selectivity for IR Radiation

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We report on the development of multilayer based solutions to enhance the spectral purity of EUV light generated by plasma-based sources. These multilayer systems reflect EUV radiation and simultaneously suppress infrared (IR) light, e.g. scattered CO₂ laser radiation of the laser-produced plasma. Two possible solutions are discussed: 1) the planar mirrors combining EUV-reflective properties of multilayer Bragg reflectors together with IR antireflection based on the effect of destructive interference; 2) hybrid multilayer gratings combining EUV reflection with spectral-selective suppression of the specular IR reflectance due to the grating phase-shift resonance. Review of experimental results is given for 13.5 nm optics and 6.x nm optics relevant for EUV lithography and beyond.

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