

Design and fabrication of chirped multilayer mirror in the extreme-ultraviolet region

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Abstract:

The procedure of Genetic algorithm in optimizing multilayers for the extreme-ultraviolet is presented. Chirped multilayer mirror is designed using Genetic algorithm. The normal incidence reflectivity and chirp in the wavelength range of 12.5-16.5 nm are $6.7 \pm 0.5\%$ and $-3617 \pm 171 \text{ as}^2$ respectively. Its capability of producing subfemtosecond pulses is shown by numerical simulation. Results indicate designed chirped multilayer mirror can produce pulses of 104as in duration. The chirped multilayer mirrors were fabricated by using magnetron sputtering. The process was optimized and some chirped multilayer mirrors were made by using optimal process parameters. The reflectivities were characterized by Hefei synchrotron radiation facility and the measured results were analyzed.

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