

## Development of beam splitters for the EUV region

Hisataka Takenaka, Satoshi Ichimaru, and Eric M. Gullikson\*

*NTT Advanced Technology Co., 162 Shirakata, Tokai, Ibaraki, 319-1193,  
JAPAN*

*\* Lawrence Berkeley National Laboratory, 1 Cyclotron Rd, Berkeley, CA 94720,  
USA*

We are developing beam splitters for the extreme ultraviolet (EUV) region, which have application to an ineterferometric X-ray microscopy, polarization experiments, and so on. The beam splitters were designed for the EUV region such as wavelengths of around 6 - 30 nm, and various incident angles. The fabrication involves the deposition of multilayers on a SiN membrane by magnetron sputtering, and the subsequent removal of the SiN membrane by reactive ion etching. Figure 1 is a photograph of a fabricated transmittance type beam splitters for a wavelength of around 6 nm. The window is 10 mm square. Measurements on Beamline 6.3.2 of the Advanced Light Source revealed the reflectivity of a CoCr/C beam splitter to be 8.7% and the transmittance to be 4.4 % at a wavelength of 6.36 nm and an incident angle of 45 degrees. The reflectivity of the Cr/C beam splitter to be 5.8 % and the transmittance to be 6.6 % at a wavelength of 6.15 nm and an incident angle of 80 degrees. Figure 2 is a measured reflectivity and transmittance of CoCr/C multilayers for an incident angle of 45 degree.

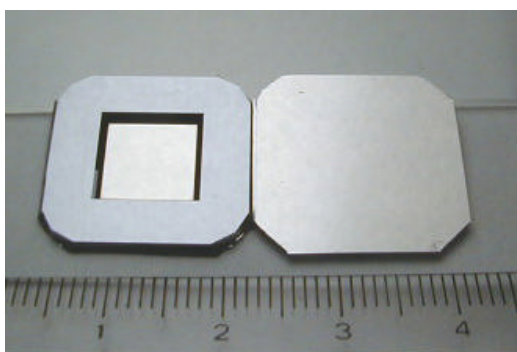


Fig. 1 Photograph of transmittance type beam splitters.

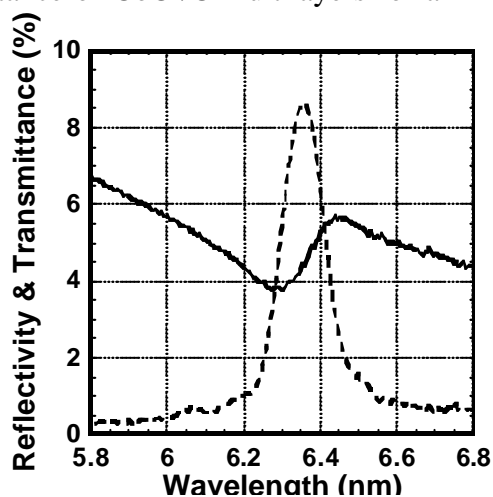


Fig. 2. The measured reflectivity (dotted line) and transmittance (solid line) of a CoCr/C beam splitter.