



1. Title:	Dual ion beam sputter deposition for EUVL optics: Large area and high reflectance
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3. Abstract body:

The topic of this presentation is the improvement of the ion beam sputter deposition technology (IBSD) for the fabrication of EUV reflective coatings based on molybdenum/silicon (Mo/Si) multilayers.

The advantages of IBSD compared to magnetron sputter deposition (MSD) are the lower defect levels and the lower sensitivity of the multilayer reflectance to substrate roughness. On the other hand, up to now highest reflectances of Mo/Si multilayers made by IBSD are less than 68 %, which is a major drawback in comparison to MSD optics, where reflectances of more than 70 % can be achieved. Furthermore the requirements on long-term stability and lateral uniformity of the ion beams are critical issues of the technique in order to achieve precise EUV coatings for large area mirrors.

We will present results of fabrication and characterization of Mo/Si multilayers using a new IBSD machine with two linear ion sources. This approach ensures the scalability of the process to larger substrates. In order to improve the EUV reflectance we transferred the concept of thin barrier layers successfully to the IBSD technology. We will show the influence of carbon barrier layer thickness on multilayer contraction and EUV reflectance. Furthermore the internal stress of the multilayers was investigated for different process parameters.