



1. Title:	Impact of Imaging Optics Quality on Actinic Mask Blank Inspection
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3. Abstract body:

In the MIRAI actinic inspection platform, the 20x Schwarzschild optics have been replaced with new 26x optics, and its impact on the sensitivity has been tested. Aside from the impact of the increased magnification, the impact of quality of the imaging optics on the sensitivity has been quantitatively characterized by using a new mask designed for flare evaluation as well as by extensive analysis of the images of a programmed defect mask blank. The results indicated that EUV scattering corresponding to high frequency figure error increased significantly in the new optics. The experimental results have been compared with the measurement of the optics aberration and with the mid-spatial frequency roughness of each mirror. The experiments are found to be consistent with a prediction from a model calculation based on the power spectral density (PSD) functions for each mirror. Therefore, this experimental methodology combined with the computational analysis is found to be valuable to confirm the quality of optics in the scheme of the dark-filed actinic inspection. The learning can also be utilized to rigorously quantify the specification of the quality of the projection optics for a production-worthy full-field actinic mask blank inspection tool.

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