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Microscopy of extreme ultraviolet lithography masks with 13.2 nm tabletop laser illumination S. CARBAJO, F. BRIZUELA, Y. WANG, C.A. BREWER, F. PEDACI, W. CHAO, E.H. ANDERSON, Y. LIU, K.A. GOLDBERG, P. NAULLEAU, P. WACHULAK, M.C. MARCONI, D.T. ATTWOOD, J.J. ROCCA, C.S. MENONI, COLORADO STATE UNIVERSITY TEAM, LAWRENCE BERKELEY NATIONAL LABORATORY TEAM — We report the demonstration of a reflection microscope that operates at 13.2 nm wavelength with a spatial resolution of 55+/-3 nm. The microscope uses illumination from a tabletop extreme ultraviolet laser to acquire aerial images of photolithography masks with a 20 s exposure time. The sample used for the initial demonstration of this EUV microscope consisted of Ni grating and elbow patterns printed onto a Mo/Si multilayer coated 2.5×2.5 cm square Si wafer. Patterns with half-pitch sizes ranging from 80 nm to 500 nm were successfully printed onto the Mo/Si coated sample. The modulation transfer function of the optical system was characterized and these results constitute a first step toward the realization of table-top actinic microscopes for EUVL mask inspection.

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