Abstract Submitted
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Metrology for Nanoscale Manufacturing[1] ALEXANDER MUNOZ, Arizona State Univ — The extension of optical techniques to the nanoscale is increasingly powerful because manufacturing requires fast, in-line, non-destructive metrology. As part of the NASCENT NSF Engineering Research Center led by the University of Texas at Austin, the focus of the effort is on the tools necessary for establishing manufacturing infrastructure required for process control of nanoscale printing. The initial exploration of scatterometry involved the use of a 244 nm laser to evaluate the zero-order reflectivity as a function of angle of incidence for two polarizations. Measurements of the wire-grid polarizer were then repeated with 405 nm to investigate the extensibility of scatterometry. In conjunction with the scatterometry data, rigorous coupled wave analysis simulations were used to determine the behavior of the reflectivity as a function of five critical dimensions. Varying the parameters led to the ability to fit the simulation curves to the experimental data, thus revealing the dimensions of the wire-grid polarizer. Grating profiles are established continuously allowing for the implementation of roll-to-roll manufacturing as envisioned by NASCENT. Scatterometry is a workhorse of Si lithography because of its fast, non-contact measurements at extreme sub-wavelength scales.

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Alexander Munoz
Arizona State Univ

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