Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Defect-Free nanoscale printing using the Talbot effect[1] MARIO MARCONI, WEI LI, VICTOR MARTINEZ ESQUIROZ, LUKASZ URBANSKI, DINESH PATEL, CARMEN MENONI, Colorado State Univ, AARON STEIN, Brookhaven National Laboratory, WEILUN CHAO, ERIK ANDERSON, Lawrence Berkeley National Laboratory — An Extreme Ultraviolet (EUV) lithography technique that utilizes a compact EUV laser to print nanoscale features on a photoresist is presented. The lithographic method uses the Talbot effect and is based on the self-imaging produced when a periodic transmission mask is illuminated with a coherent light beam. A periodic mask composed of an array of tiles with an arbitrary design produces self images that are used to replicate the mask in the surface of a photoresist. When illuminated with coherent light, the tiled diffractive mask produces images which are 1× replicas at certain locations (Talbot planes). The self-images are generated by the diffraction of the thousands of cells in the mask. Thus, any defect in any of the unitary cells is averaged over a very large numbers of tiles consequently rendering a virtually defect-free image. This is a unique characteristic of this photolithographic approach.

[1]This work was supported by NSF awards ECCS 0901806, EEC 0310717 and SBIR 1248924 and DOE Contract DE-AC02-98CH10886.

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Date submitted: 15 Nov 2013 Electronic form version 1.4