EUV Lithography: Current Research and Perspective

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Abstract

With high-NA EUV Lithography entering its industrial R&D phase at various pilot lines this year, there are still a number of significant technical and scientific challenges to be addressed to ensure its success in manufacturing. I will describe some of these challenges, such as the tradeoffs between sensitivity, resolution and LER for patterning materials, as well as that of the mask 3D effects.
Looking forward, there appears to be a continued need to support further 2D scaling for leading-edge devices. I will provide a perspective on the potential solutions for extending EUV lithography toward such a goal. In particular, I will give an update on the initial Hyper-NA R&D effort and the possibilities of using shorter actinic wavelengths (e.g., 'Beyond EUV' or BEUV), with a particular emphasis on the research needed for patterning materials, sources, optics and masks.