

Contact Size Variations: Dissecting the Sources

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The large k_1 factor afforded by EUV lithography has significant benefits in terms of printing contacts. Truly understanding the limitations of EUV lithography in this regime, however, requires an understanding of the dominant sources of contact size variation. Sources and aggravating factors include, mask roughness, shot noise, optical error enhancement factor, resist error enhancement factor, etc. Here we describe these terms and their relative importance in detail. The results show that although the optical error enhancement factor is quite low at EUV, resist is a significant aggravating term reducing the tolerance to error terms such as mask roughness.

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Dr. Patrick P. Naulleau has been involved in EUV lithography since 1997 when he joined Lawrence Berkeley National Laboratory (LBNL) to work in the area of actinic interferometric alignment. Since 2001 he has lead LBNL's EUV Patterning project starting with the 0.1-NA ETS optics and now the 0.3-NA MET optic. He is internationally recognized for leading EUV patterning studies and his contributions to EUV System designs. He is the lead author of chapter on EUV Patterning in the book EUV Lithography.

