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Modeling Process Latitude in UV Projection Lithography

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ABSTRACT

The degree to which critical performance parameters are stable against small variations in process parameters is called process latitude. In order to achieve manufacturability, processes must be developed which exhibit broad process latitude. It is costly and time-consuming to experimentally define process latitude over the full range of the parameter space. On the other hand, good models can allow a process engineer to search only the relevant regions of parameter space. In this letter, advanced computer models of UV microlithography are used to study the impact of the "notching phenomenon" (exposure enhancement near steps in the exposure plane) on process latitude. It is shown that notching effects give rise to a surprising, rapid degradation of resist development process latitude.