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Author Jun-Zhang Huang
Author's Email Address No Public.
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Abstract
With the rapid development of semiconductor industry, lithography technology of higher density and narrower line-width has become the most important step of IC manufacture. When the line width of mask pattern is smaller than the light wavelength, it may result in line-width deviation or other distortion of the image on the wafer after lithography. These phenomena will reduce the IC e±ciency or make
the whole design fail. Therefore, the Optical Proximity Correction (OPC) enhances the image resolution on the wafer and compensates image deviation to increase yield by the skill of compensating Mask pattern.
The core simulation engine in this thesis is the SPLAT, developed by UCB,which can be used to analyze the photolithography on a prede¯ ned layout pattern. Based on this tool, we have inspected the optical proximity effect on the mask pattern and developed a preliminary OPC system. In this system it provides a parametric mask pattern generator to generate scalable pattern to improve the efficiency on constructing OPC rules. Also a GDSII to SPLAT format converter is implemented to translate from the geometrical diagram drawn by layout tools Virtuoso to the input of SPLAT simulator.
Besides, a friendly GUI interface is implemented to show and verify the deviation between the image data after OPC and prede¯ ned patterns. The OPC rules we used in this system are the aggression rule and the extend rule. According to the aerial image generated by SPLAT, the proposed system not only calculate the deviation but also generate the compensated patterns to the speci¯ c edges and cor-
ners. From the experimental results, we can ¯ nd that the average deviation can be reduced from 28.7% to 2.69% within 5 times of iteration.
Finally, the programming languages used in this system are Python/Tk and SKILL. Thus our system can be linked to the existing EDA tools and provide a framwork to OPC flow integration.
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