Conversion of a 2D Routed Standard Cell Library to 1D Gridded Design

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Background

• Rayleigh Criterion: \( \theta = \frac{k_1 \lambda}{d} \)
  – EUV (approx. 15nm) systems still not commercially viable
  – Solution: 193i with multiple patterning

• At such sub-wavelength conditions, trace distortion becomes significant, especially for 2D shapes
  – Solution: 1D gridded design: alternating layers of parallel traces
Research Statement

• Conversion of 14nm Nangate Open Cell Library, a traditional 2D routing library, to a 1D gridded design
  – Resolves: Lack of FOSS/Open 1D Gridded Design Libraries
  – Investigate specificities of 1D gridded design – will be key to triple/quad patterning due to less distortion
  – Learn about IC design and layout process
Current Progress

• Research and Learn about 1D gridded design/IC design – Complete

• Conversion of Open Cell Library to a 1D design
  – Conversion to 1D gridded design – Complete
  – Verification via DRC/Logic Simulation/LVS – In Progress
Future Plans

• Complete verification of 1D standard cells
• Implement IC using the aforementioned cells