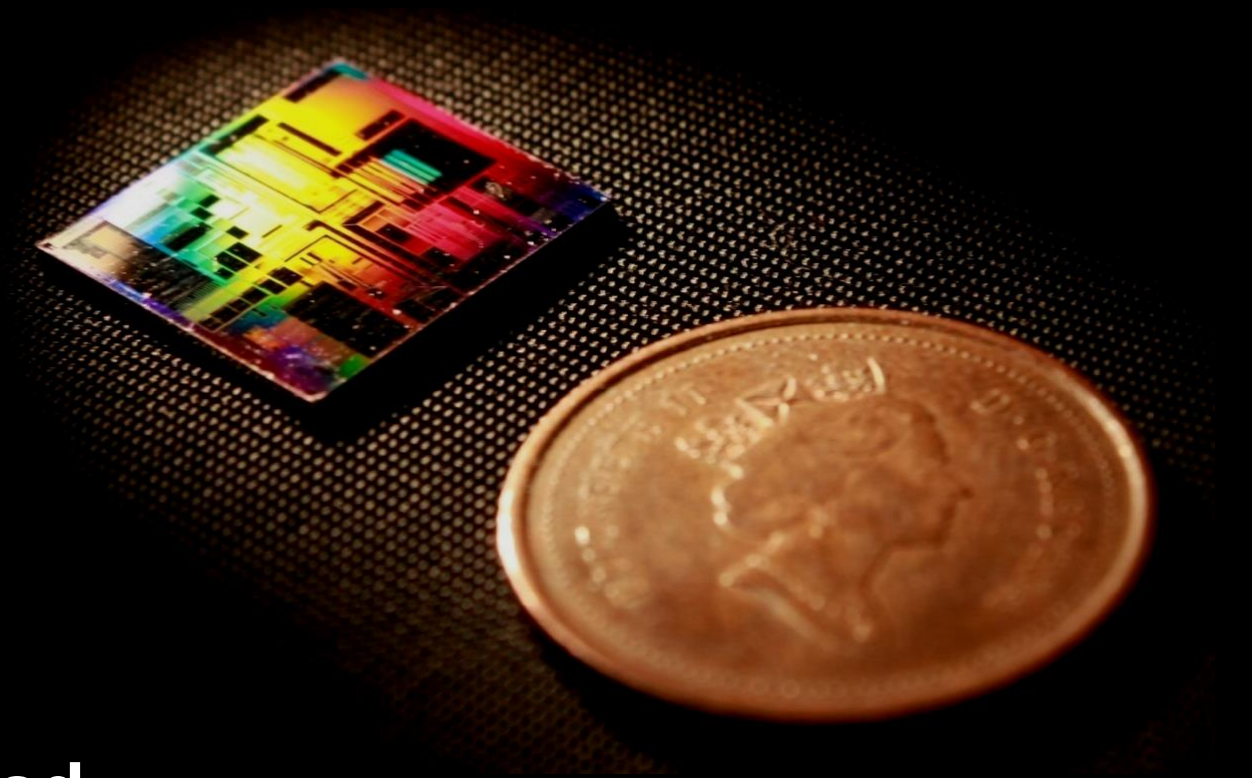
SiEPIC-TOOLS:

PCM Structures



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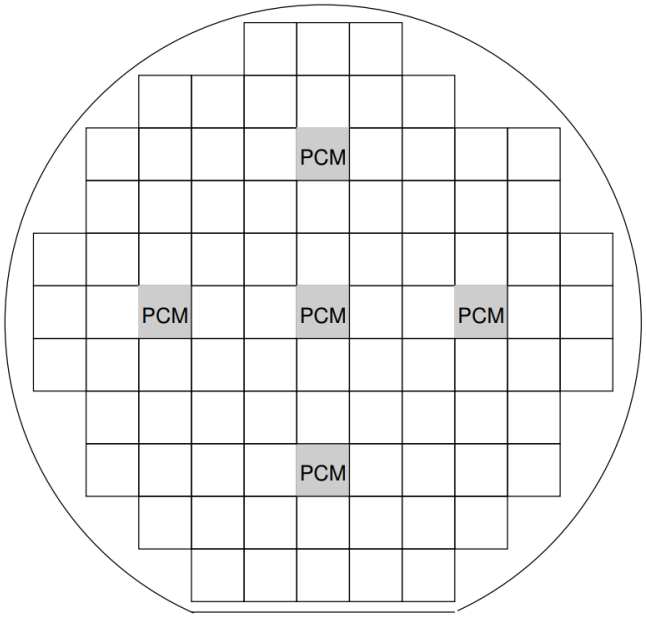
Definitions

1) PCM (Process Control Monitors) structures are commonly used to characterize the performance of the fabricated chip/wafer.

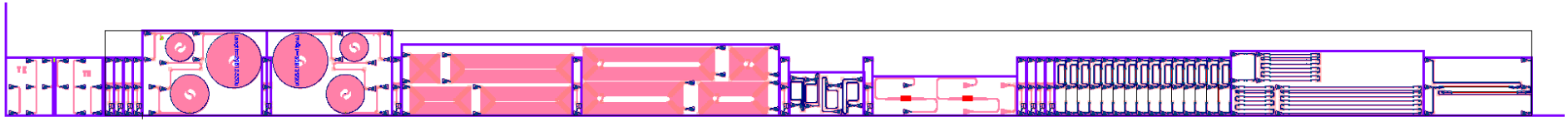
2) PCM Structures help the designers understand why some of the designed devices behave differently than what's designed.

3) Typical PCM structures in silicon photonics fabrication processes extract information such as the waveguide propagation losses for the different modes and help the designers understand the minimum feature constraints.



SiEPIC PCM

Every tape-out will ideally include the following PCM structures

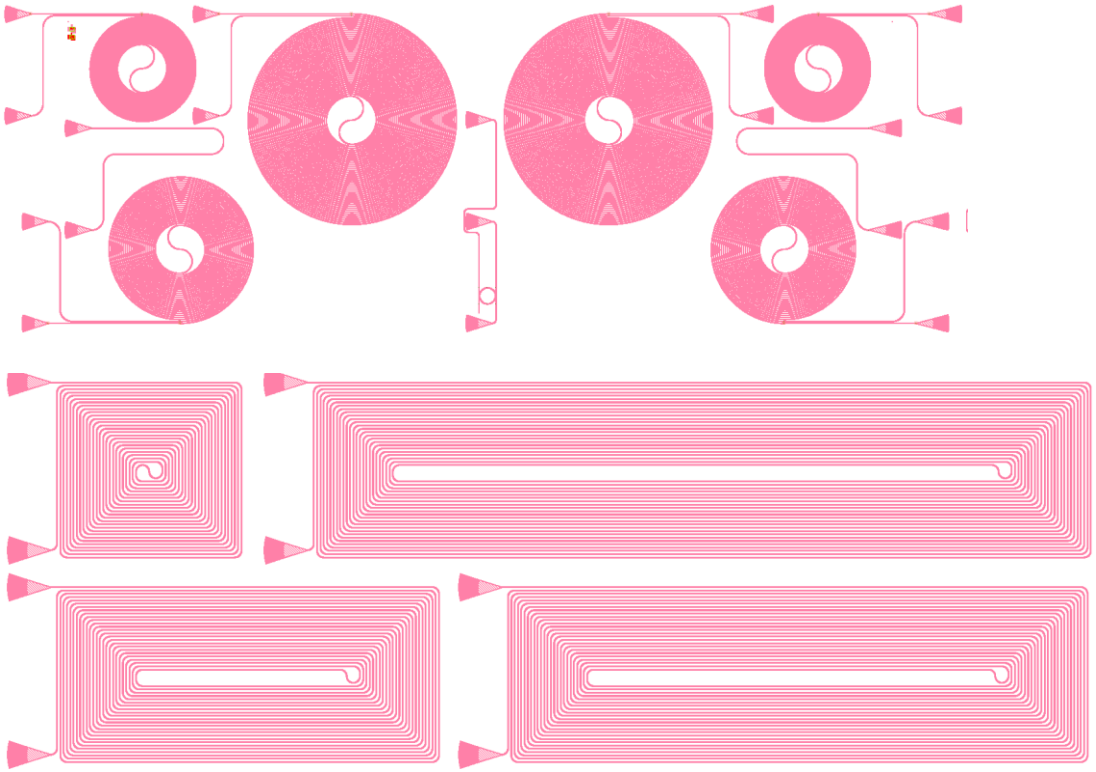


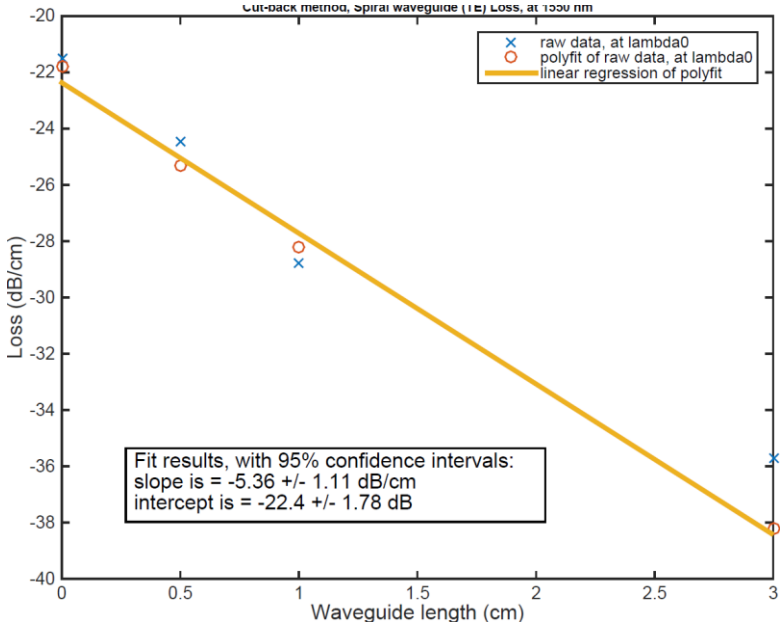
Structures include:

- Spiral strip waveguides of different lengths (TE & TM)
- Straight strip waveguides of different lengths (TE & TM)
- Sub-wavelength waveguiges of different lengths
- Ring resonators
- Mach-Zehnder Interferometers
- Photonic crystals
- Bragg gratings
- Bragg gratings-assisted contra-directional couplers (contraDCs)

Strip waveguide cut-back

Waveguides of different lengths are used to extract the propagation losses of the waveguides, for both TE and TM.





Benchmark devices

A variety of benchmark devices are included, to ensure that the devices are fabricated properly in the tape-out. Devices include:

- Sub-wavelength waveguides
- Ring resonators (TE & TM)
- Mach-Zehnder interferometers (TE & TM)
- Contra-directional couplers (varies corrugation strength)

Bragg gratings

Increasing the corrugation strength of the Bragg waveguide results in increasing the bandwidth of the filter response. By sweeping the corrugation strength ΔW, we can reproduce the curve of every fabrication tape-out.