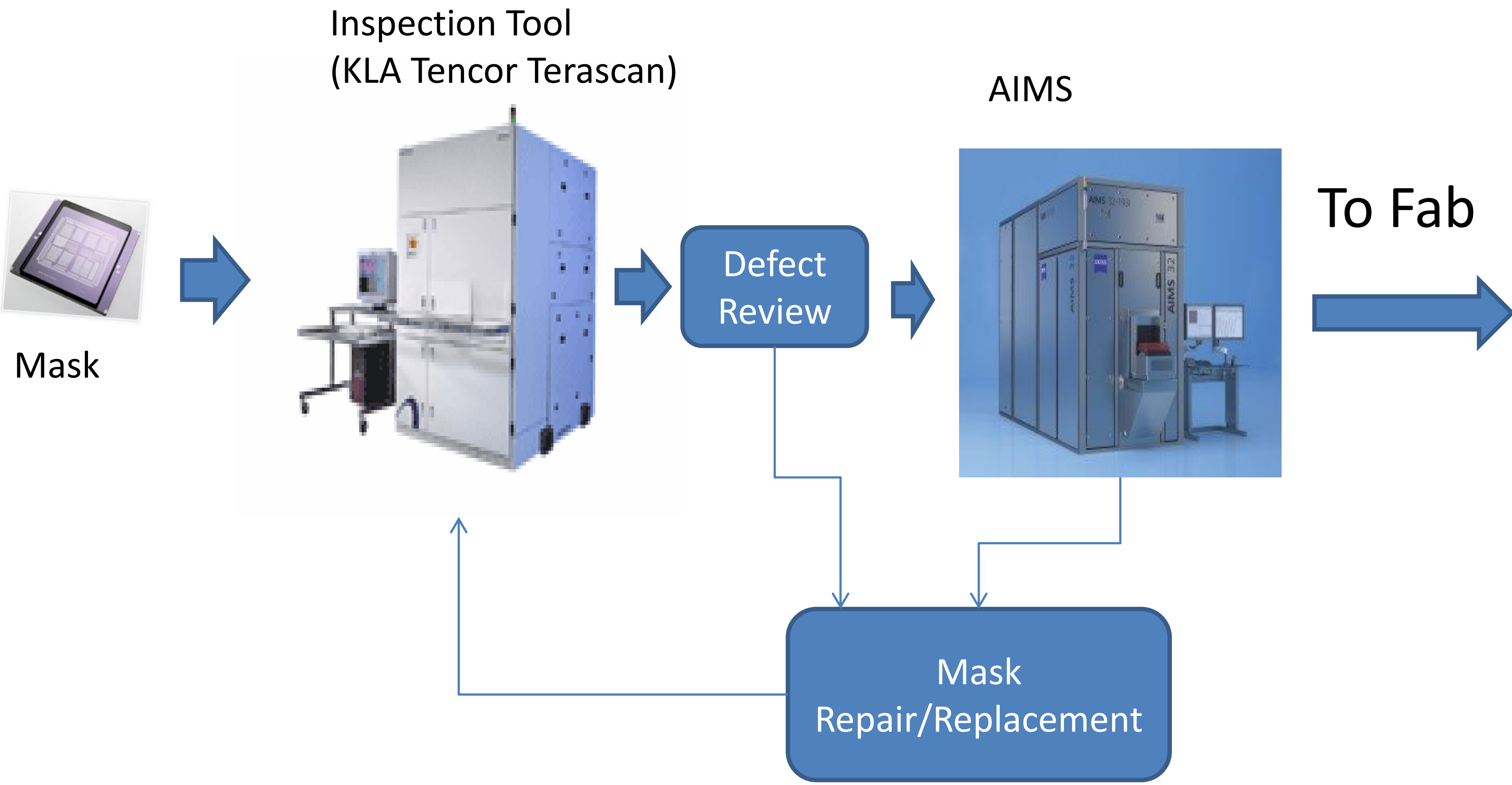
Mask Inspection

Inspection Flow



Mask

Inspection Tool
(KLA Tencor Terascan)

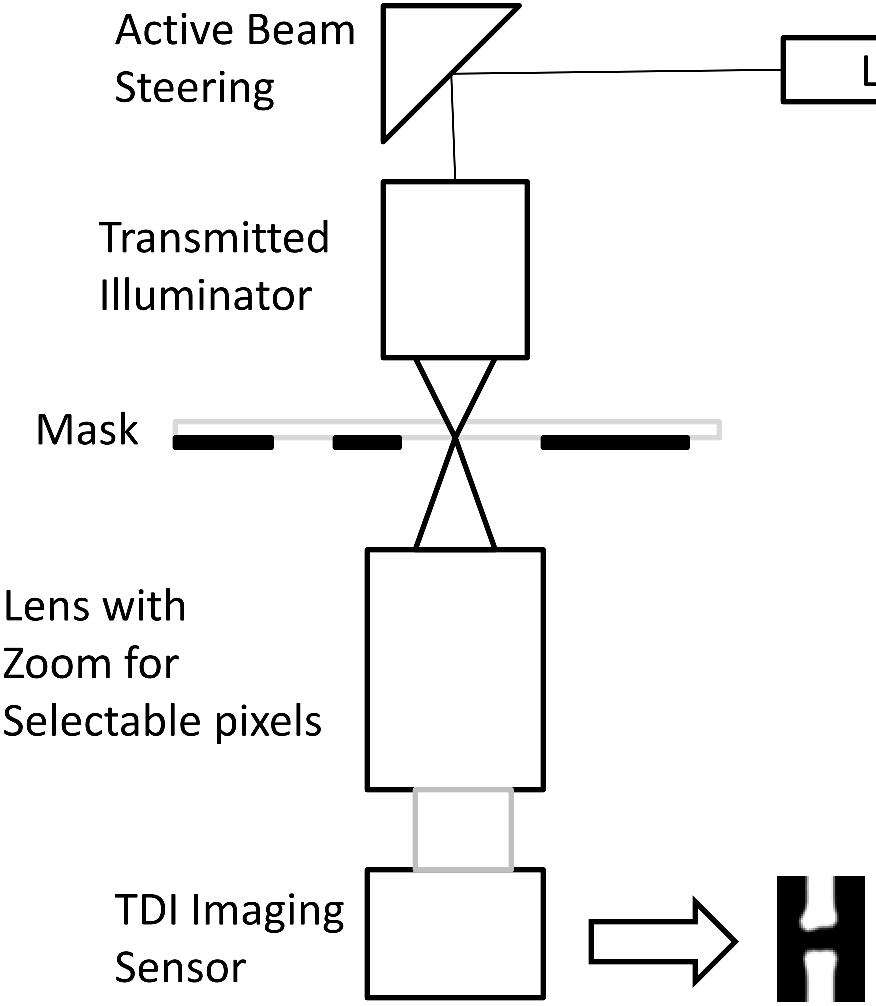
Defect Review

AIMS

To Fab

Mask Repair/Replacement

Inspection Tool



Active Beam Steering

Laser

Transmitted Illuminator

Mask

Lens with Zoom for Selectable pixels

TDI Imaging Sensor

Key Features:

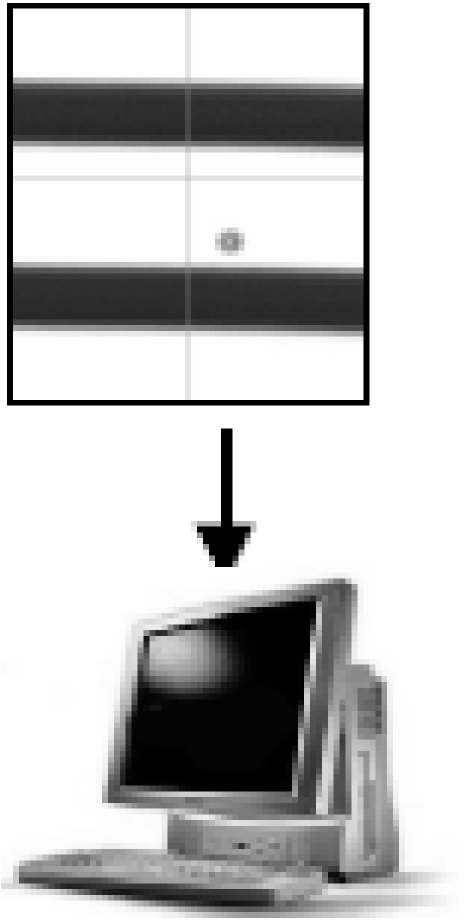
- Transmitted Illuminator allows different contrast for binary and PSM

- Time Domain Integration(TDI) sensor: Faster, lower light levels required compared to CCD

Inspection Tool

- Modes: Die-die and die-database
- Defects <20nm can be detected
- Current tools have reflection illumination also
- Generates 1000+ defects, most nuisance

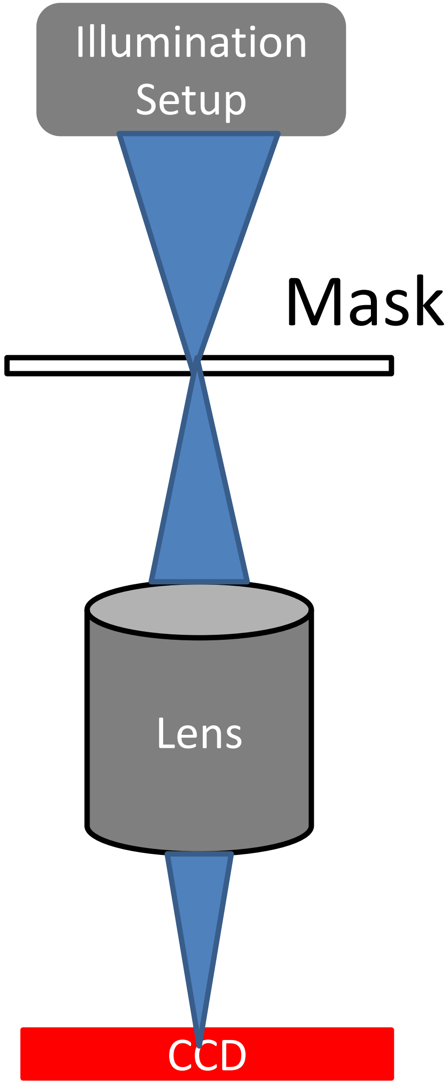
Defect Review



Criteria for Defect classification:

- Size
- Type
- Location
- wafer CD change(simulation)

Aerial Imaging Measurement System(AIMS)



Illumination Setup

Mask

Lens

CCD

Aerial Imaging Measurement System(AIMS)

- Gold Standard
- Emulates Stepper with adjustable NA, exposure, etc.
- Image equivalent to that on photo resist

Issue:

- Too slow