Maglen Ebeam Wafer Imaging System

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Agenda

- Introduction
- Review of Previous Works
- Progress
- Miniaturization
- Advantages
- Summary
Introduction

● Optical Microscope VS Scanning Electron Microscope

<table>
<thead>
<tr>
<th></th>
<th>Fast</th>
<th>Slow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blur</td>
<td>Fast</td>
<td>Slow</td>
</tr>
<tr>
<td>193nm</td>
<td></td>
<td>0.04nm</td>
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![Optical Microscope Image](image1.jpg)

![Scanning Electron Microscope Image](image2.jpg)
Review of Previous Works

- Miniaturized columns for multi-column array
- Custom print for inspection

1 column, 1 wafer, 2 years

Partial wafer inspection applications

1 column, 1 print, 2 weeks

69 columns, 1 print, 3 hours
1. Diameter: 29mm -> 20mm future
2. High resolution of 2nm with high beam current of 1nA
Small array of columns

- A Multi-Column not for parallel imaging purposes…
  …but for multi-functional common platform

SEM V1.0
- CDSEM
- Review SEM
- Physical Inspection
- Electrical Inspection

SEM V2.0
- Multifunctional
- Integrated Market

Maglen Ebeam Wafer Imaging System
Why so many SEMs

- High resolution is too hard, and SEM is just too slow. Therefore, column hardware designs must focus on some applications, while compromise on others.
Miniaturization allows common platform

2X2 small array to consolidate the market

4 Markets in 1

Change of process, higher efficiency

Reduce the redundancy

Dynamic throughput control
Change of process, higher efficiency

Common platform can quickly switch the column for the job, reduce non-productive efforts, enhance the efficiency.
When a SEM tool of any kind failed, it can be replaced by a common platform tool, and less redundancy is needed.
Dynamic throughput control

- Limited by individual tool throughput
- Spare tools can not be switched for other modes

Throughput distribution can be adjusted without purchasing new hardware.

Common Platform
- Adjustable throughputs according to demands

Split Platform
- Tools in shortage
- Backup Tool

CDSEM
Review SEM
Physical Inspection
Electrical Inspection
Spare tools not used
Summary

Miniaturization allows common platform ebeam imaging system

Consolidating the market allows economy of scale

Performance and efficiency both improves with independent optimization