

The „best“ SEM Metrology Solution

ProSEM vs. InSPEC



Metrology Products



*SEM Image Analysis &
Metrology Software*

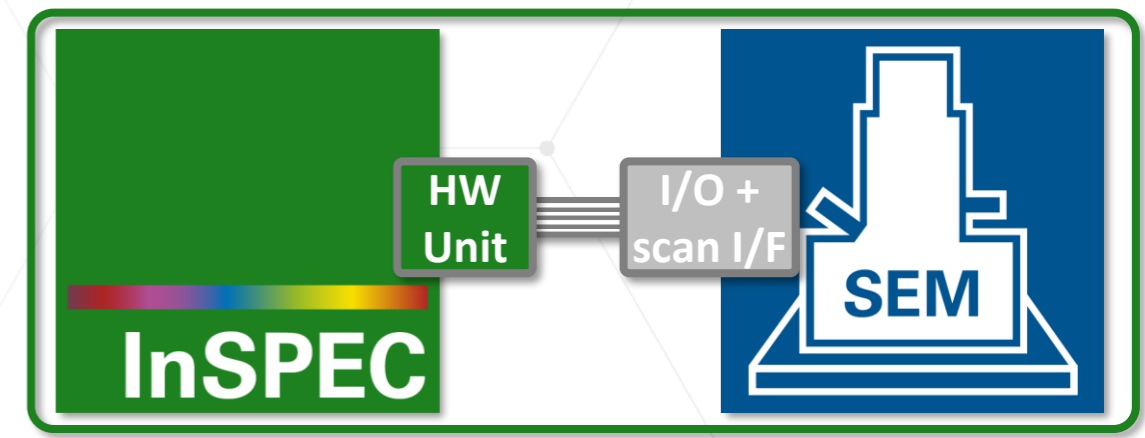
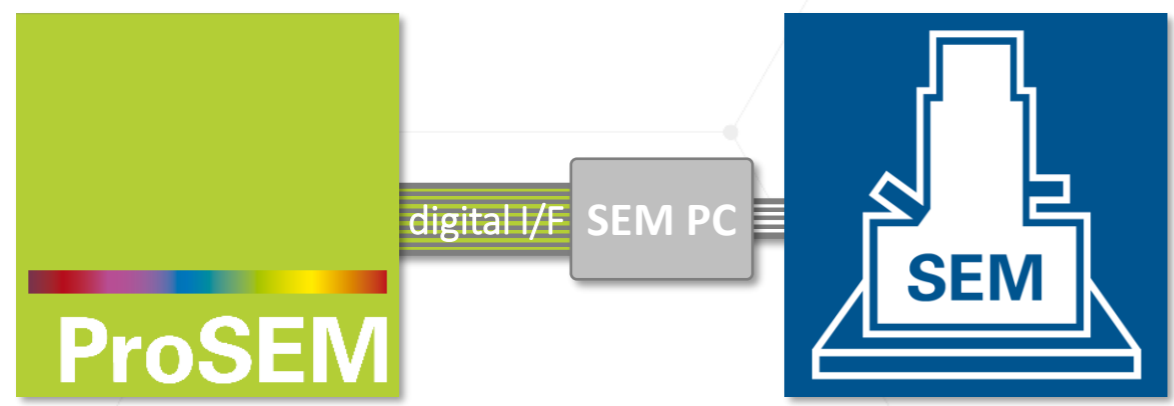
- Easy-to-use with existing tools
- Mainly offline or with SEM remote
- SEM auto: small area single field



*Integrated SEM Metrology &
Inspection Upgrade Kit*

- Sophisticated and comprehensive
- Integrated solution for experts
- Advanced multi-chip metrology jobs

ProSEM vs. InSPEC



SW for SEM Image Analysis & Metrology

Easy-to-use Offline Software Package

Optional Automation via digital PC interface

Operation in conjunction with SEM SW

Upgrade Kit for a Metrology SEM

Direct SEM control with hardware integration

Comprehensive full layout-based workflow

Integrated scanning, automation & metrology

Multi-Chip jobs with hierarchical structure

Expert metrology & data processing with "FLOW"



ProSEM

File Script View Help

SEM Image

→ *Get more results from SEM images with minimum effort*

Open Image Folder...
Open Images...
Open Project...
Import Layout...

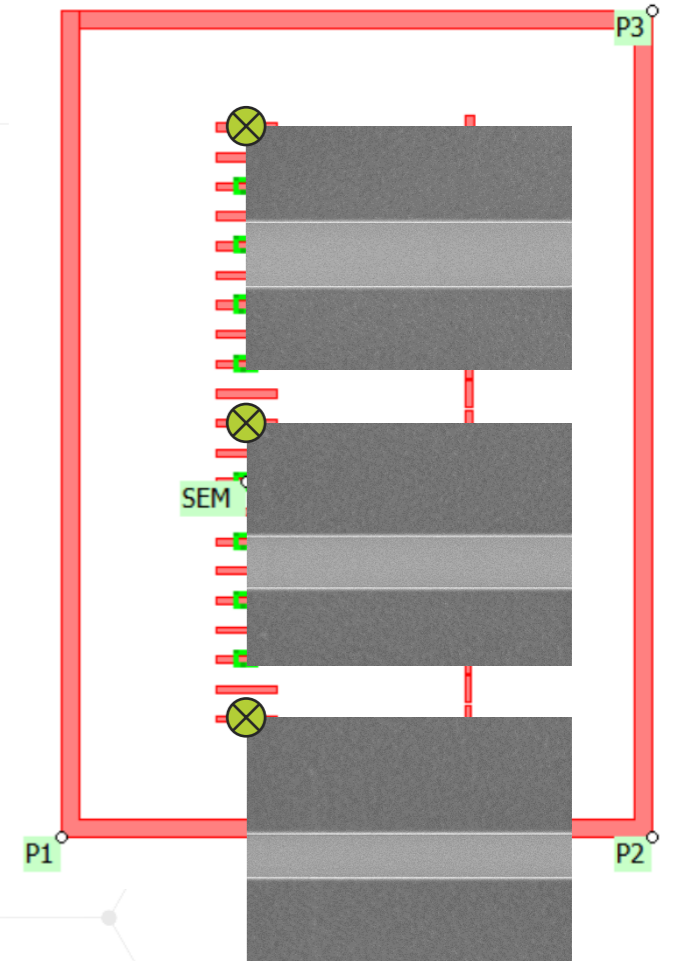
ProSEM
Advancing the Standard

Group_1

Step 1: Image Acquisition

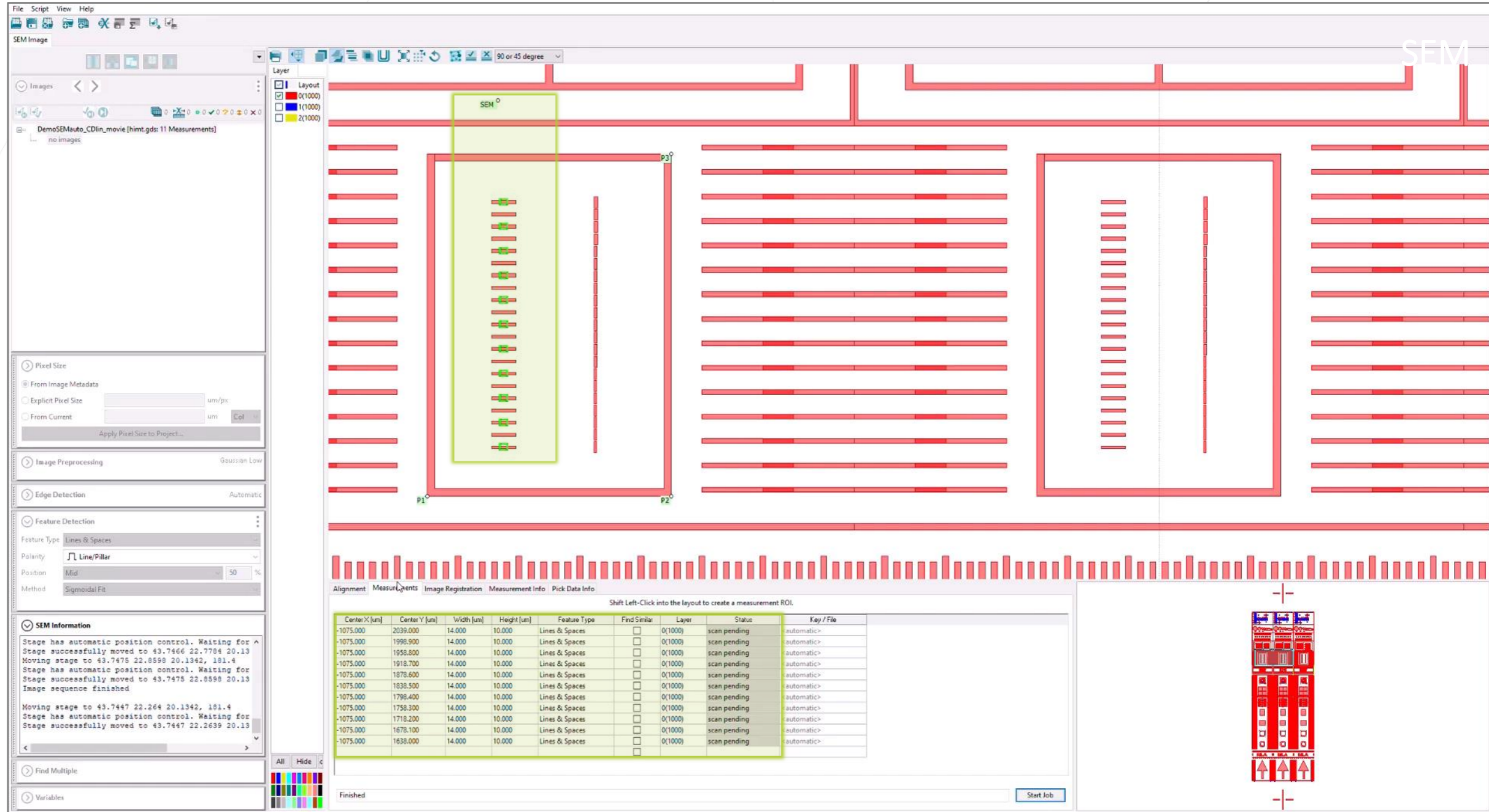
Automated metrology

- Drive SEM stage and acquire set of images



Center X [um]	Center Y [um]	Width [um]	Height [um]	Feature Type	Find Similar	Layer	Status	Key / File
-1075.000	2039.000	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan finished	<automatic>
-1075.000	1998.900	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan finished	<automatic>
-1075.000	1958.800	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan finished	<automatic>
-1075.000	1918.700	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan finished	<automatic>
-1075.000	1878.600	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scanning	<automatic>
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-1075.000	1758.300	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan pending	<automatic>
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Stop



SEM Information

Stage has automatic position control. Waiting for Stage successfully moved to 43.7466 22.7784 20.13
 Moving stage to 43.7475 22.8598 20.1342, 181.4
 Stage has automatic position control. Waiting for Stage successfully moved to 43.7475 22.8598 20.13
 Image sequence finished

Moving stage to 43.7447 22.264 20.1342, 181.4
 Stage has automatic position control. Waiting for Stage successfully moved to 43.7447 22.2639 20.13

Feature Detection

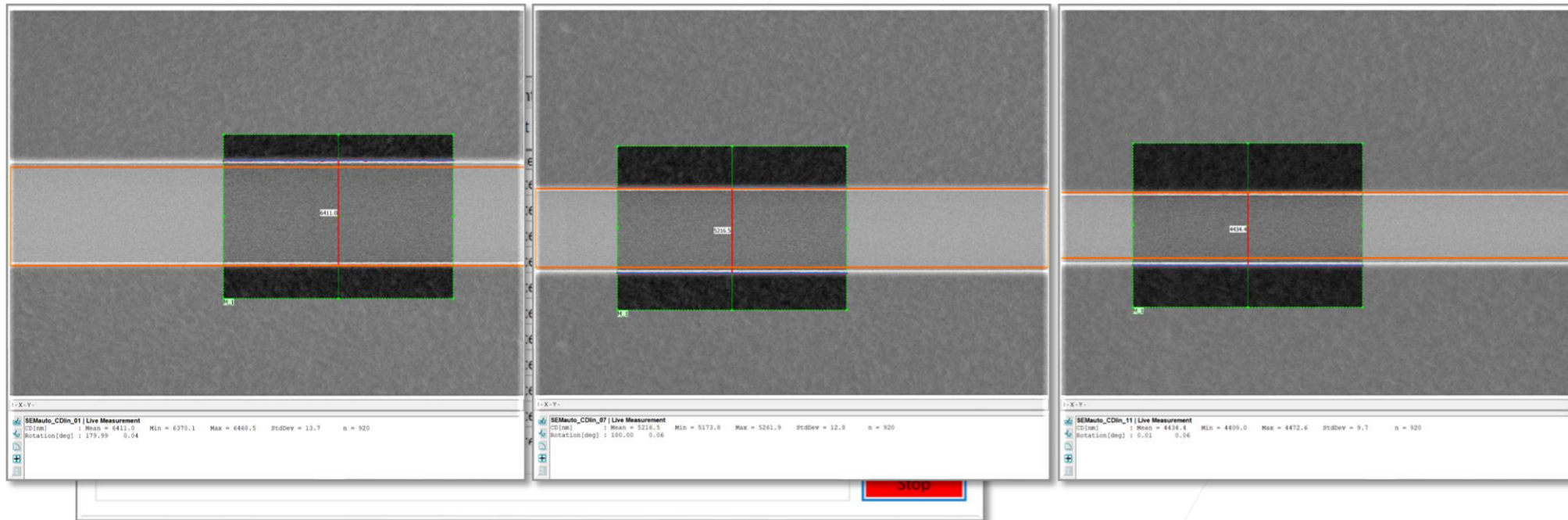
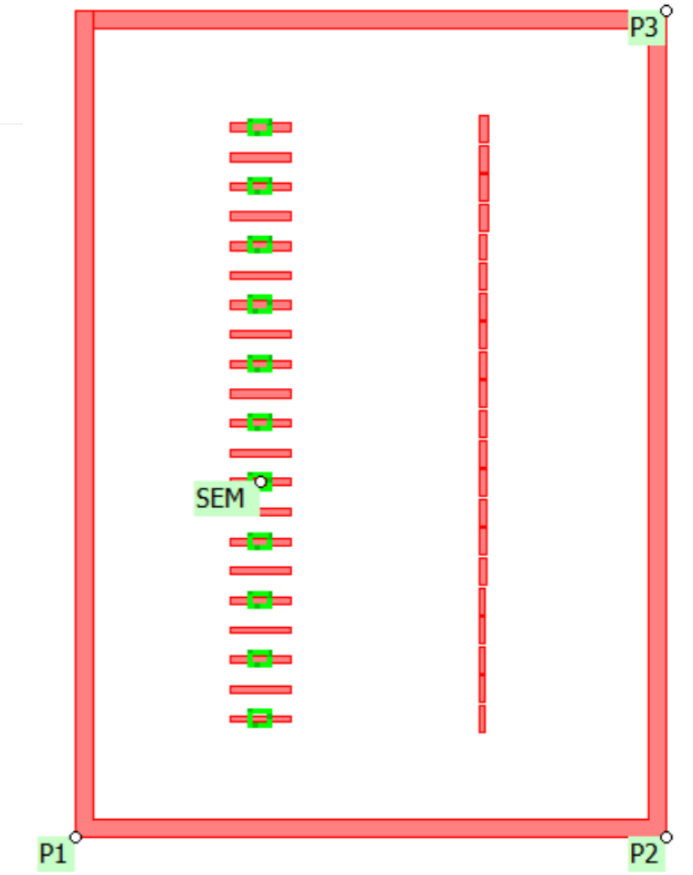
Feature Type: Lines & Spaces
 Polarity: Line/Pillar
 Position: Mid 50 %
 Method: Sigmoidal Fit

Center X [um]	Center Y [um]	Width [um]	Height [um]	Feature Type	Find Similar	Layer	Status	Key / File
-1075.000	2039.000	14.000	10.000	Lines & Spaces	<input type="checkbox"/>	0(1000)	scan pending	automatic>
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Finished Start Job

Automated metrology

- Drive SEM stage and acquire set of images
- Load images with (local) alignment
- Apply pre-defined measurements automatically
- Save results to data table



Integrated Workflow along 5 Main Modes

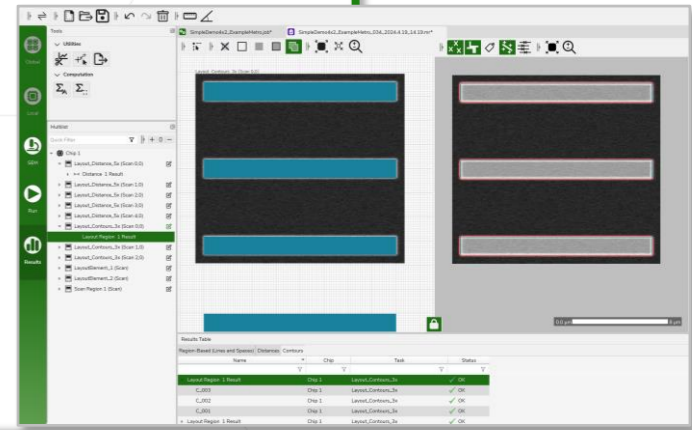
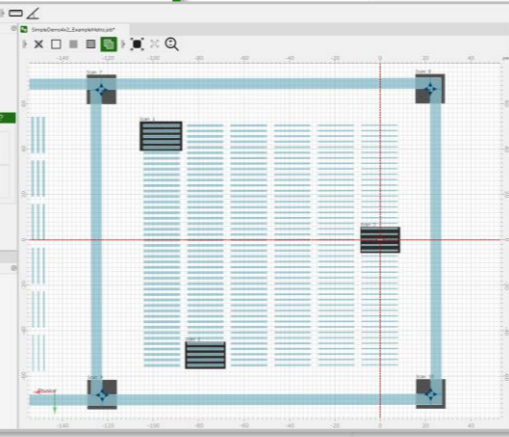
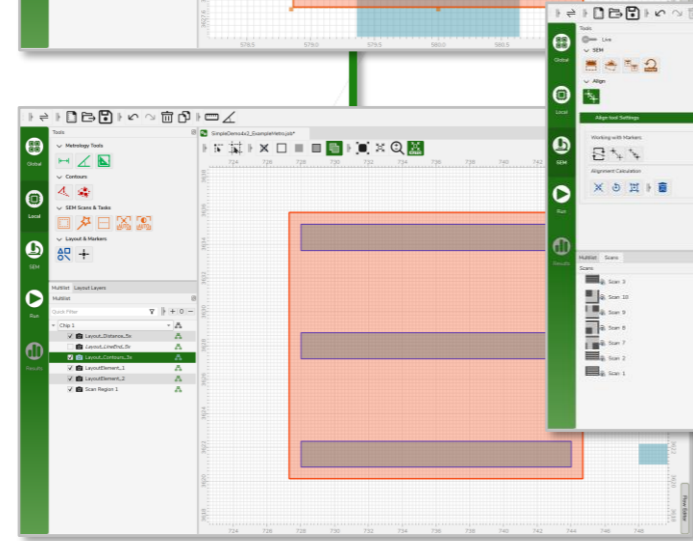
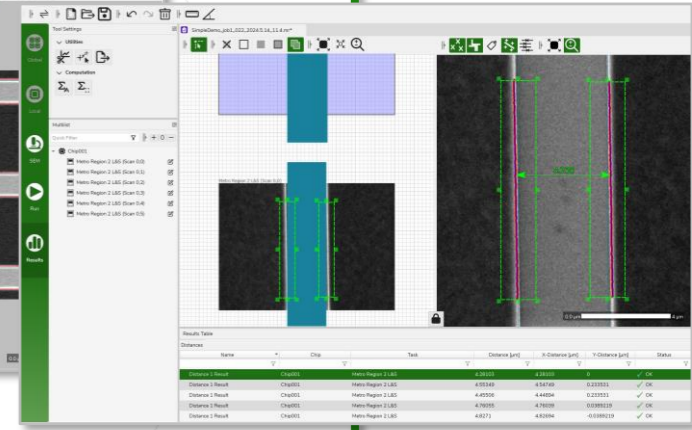
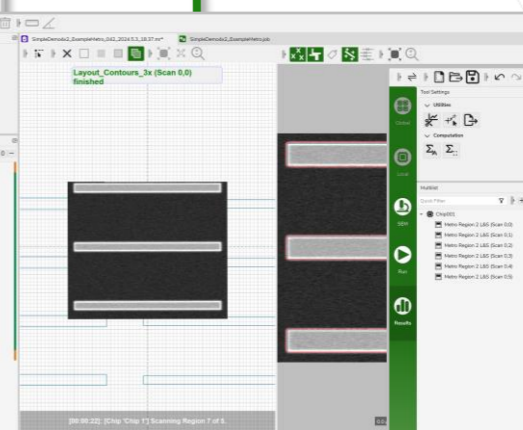
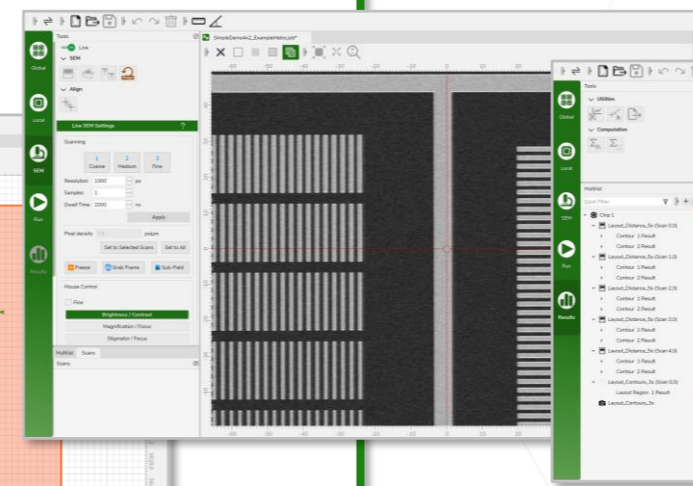
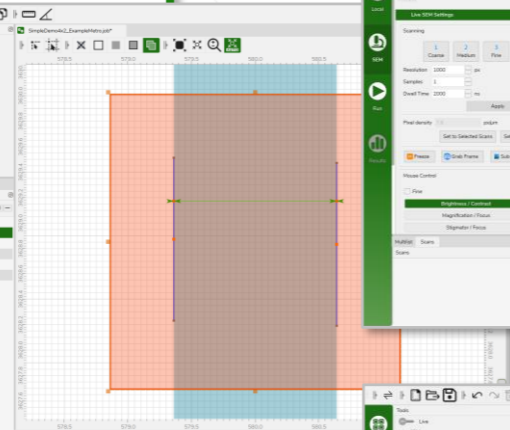
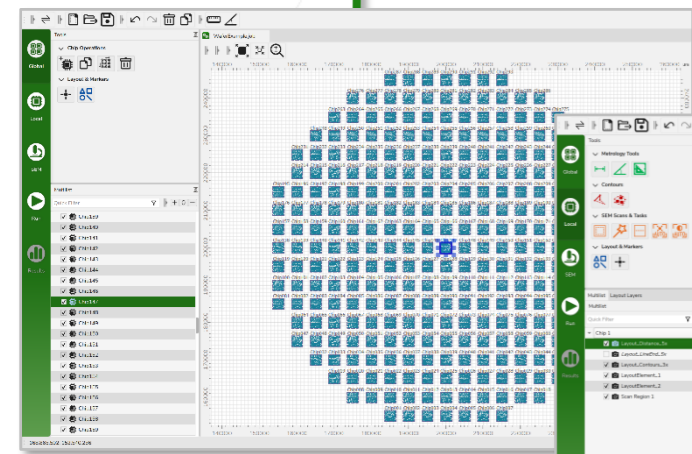
 **Global**

 **Local**

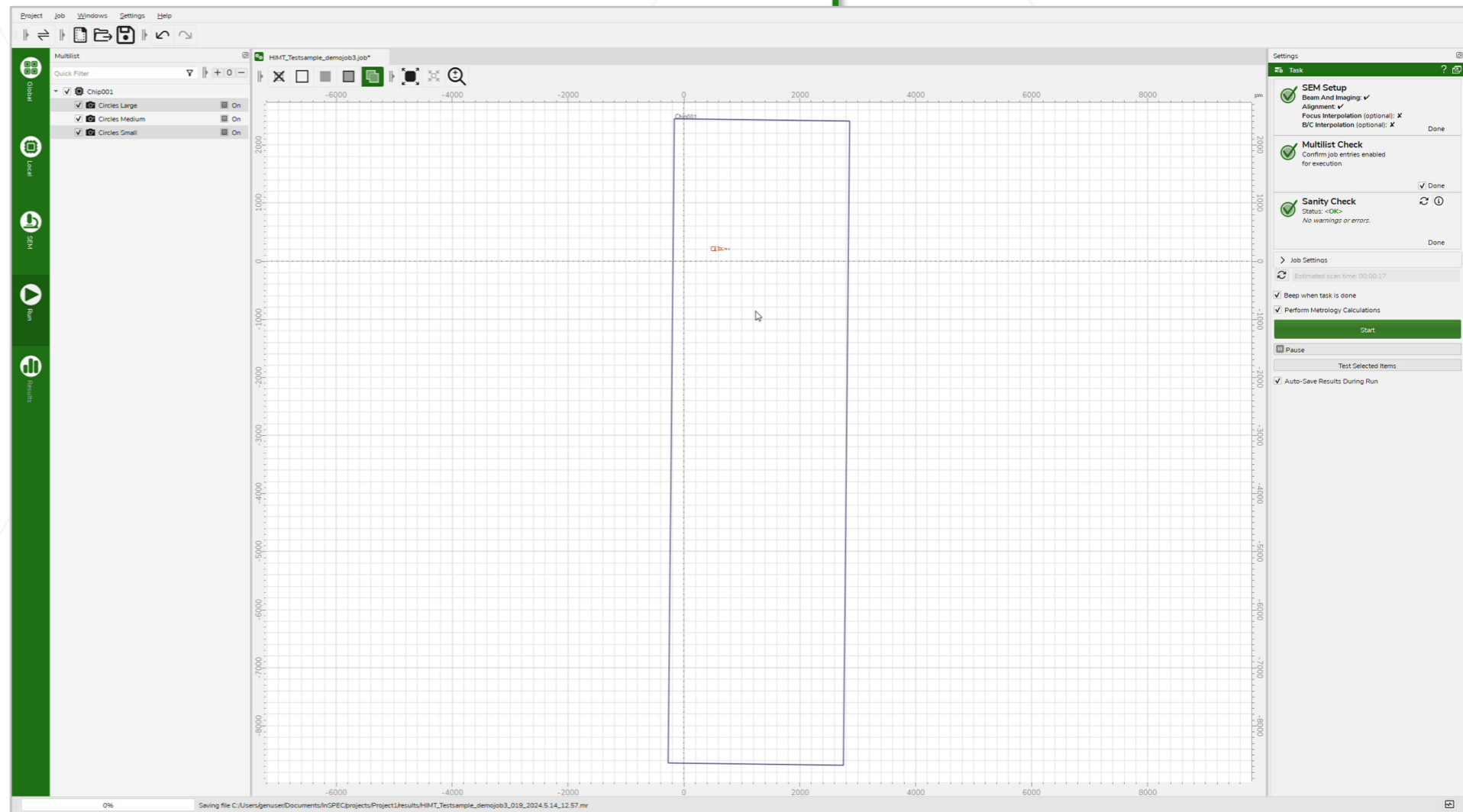
 **SEM**

 **Run**

 **Results**



Run the Metrology Job



- Job execution

- Job start and pause/ stop
- Progress of job sequence
- Live scans on layout
- Parallel activities
 - Scanning
 - Corrections
 - Contour detection
 - Metrology
 - Data processing
- Creates result file

ProSEM 3.5 Key News

- General

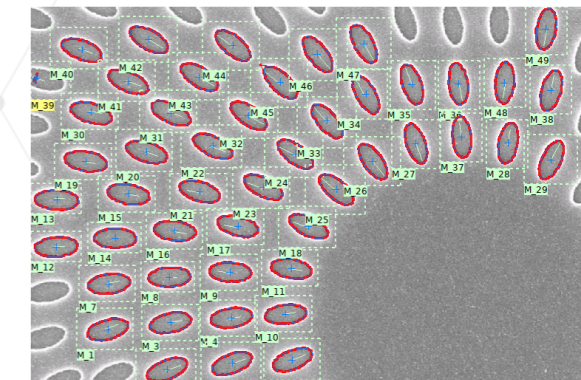
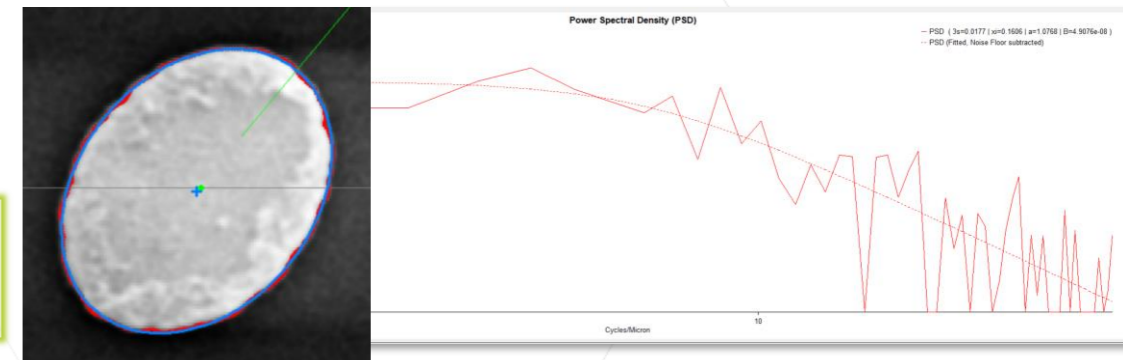
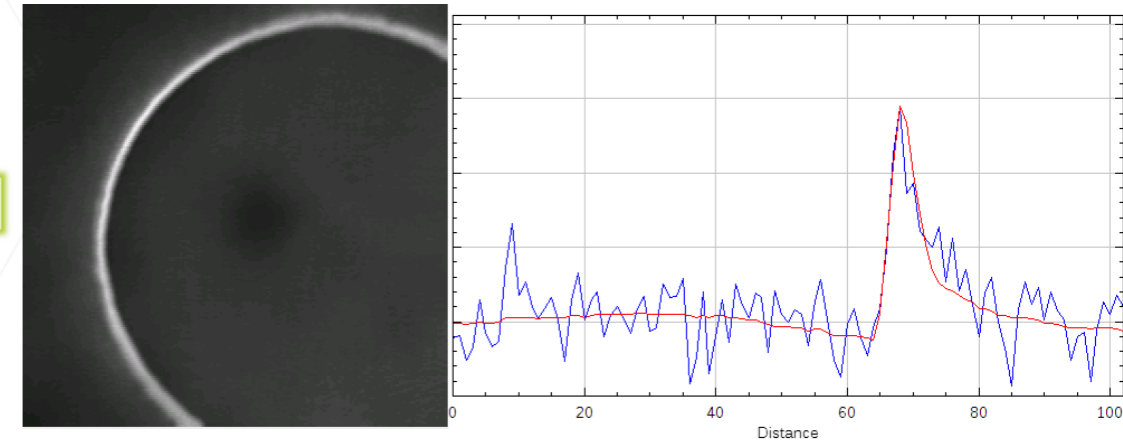
- New noise reduction filter "NL Means"
- Image meta data for various SEM formats
- Measurement data accuracy settings

- Feature Detection and Measurements

- Slice measurement for edge and fit
- Pixel calibration based on array vectors
- Advanced Package: edge roughness for fitted 2D Shapes
- Advanced Package: *Find-Modified* for rotated and scaled features

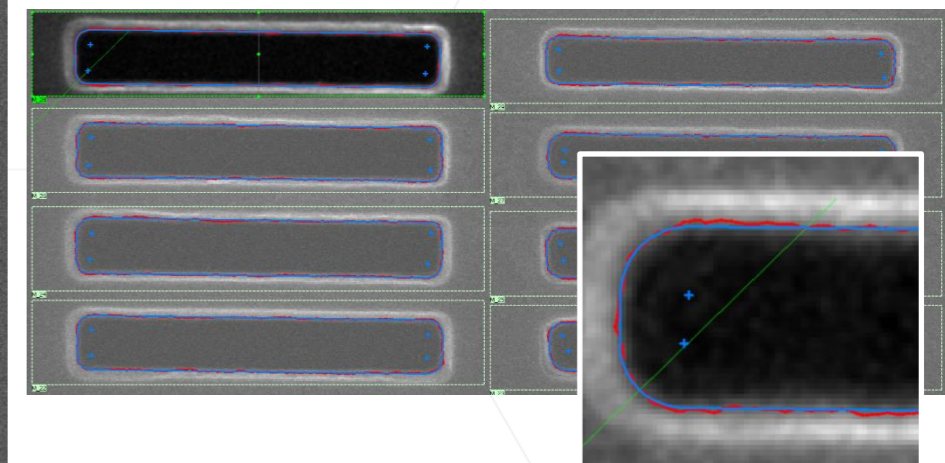
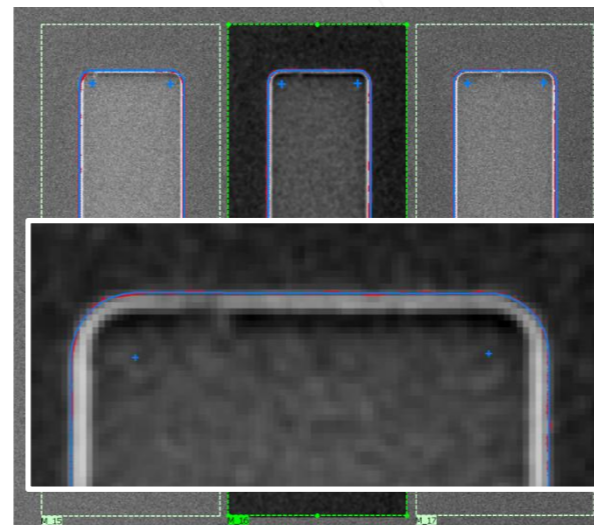
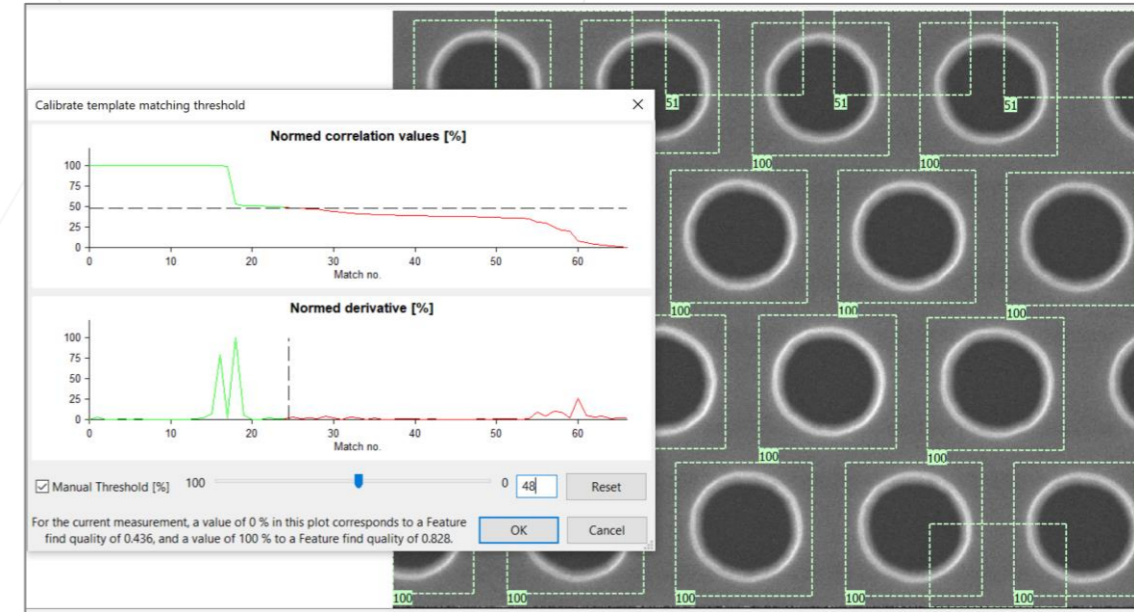
- Layout Integration/ SEM Automation

- Display and project convenience
- Automatic image naming
- SEM interfaces for JEOL and Hitachi (more to come)



ProSEM 3.6 Key News → Release in Nov 2024

- Improved performance for “NL Means” filter
- User control for template matching (find-similar, from internal dialogue)
- Projection correction for measurements (X-section tilt angle)
- New feature type “Rounded Rectangle” (for bias and blur)
- Additional SEM interfaces (2nd JEOL, 2nd Hitachi, Tescan, ...)



- **ProSEM 4.0**
 - New GUI (qt based)
 - Concept work started as “improved evolution”
 - Timeline linked to major backend topics → end 2025
- **InSPEC fully launched**
 - Release 2.0 is officially available
 - Pilot packages 1.X (until end 2024) and releases 2.Y
 - Next topics
 - Advanced scan modes
 - Integration with TRACER
 - Layout comparison/ more evaluation modules
 - Improved contour detection algorithms



Thank You!

support@genisys-gmbh.com



Headquarters

GenISys GmbH
Eschenstr. 66
D-82024 Taufkirchen (Munich)
GERMANY

☎ +49 (0)89 954 5364 0

☎ +49 (0)89 954 5364 99

✉ info@genisys-gmbh.com

USA Office

GenISys Inc.
P.O. Box 410956
San Francisco, CA
94141-0956
USA

☎ +1 (408) 353 3951

✉ usa@genisys-gmbh.com

Japan / Asia Pacific Office

GenISys K.K.
German Industry Park
1-18-2 Hakusan Midori-ku
Yokohama 226-0006
JAPAN

☎ +81 (45) 530 3306

☎ +81 (45) 532 6933

✉ apsales@genisys-gmbh.com