

Settings TAB

omatch _ □ ×

OmniMatch Litho Tool Matching Software

Settings Raw Data Analysis Options About

Settings

Litho Tool Settings

New Tool Setup

Litho Tool Setup: Default ▾

Tool Vendor: ASML ▾ Tool Type: Scanner ▾

Wavelength (nm): 193 ▾

System Reduction: 4X ▾

Wafer Size (mm): 300 ▾

Wafer Notch: Down ▾

Field Dimension	X	Y
Field Size (mm)	<input type="text" value="26"/>	<input type="text" value="34"/>
Stepping Size (mm)	<input type="text" value="27"/>	<input type="text" value="35"/>
Wafer Origin (mm)	<input type="text" value="0"/>	<input type="text" value="0"/>

Metrology

Overlay Mreg Unit: um ▾

Intra Location Unit: mm ▾

Origin Die Col#: 0 Row#: 0

Output Unit: um ▾

Output Sign Factor: +1 ▾

IVS Origin Die Col#: 5 Row#: 5

Apply Settings

Inputs - stepper and overlay tool info

File: Ready

Data Import

The screenshot displays the OmniMatch Litho Tool Matching Software interface. At the top, the title bar reads "omatch" and "OmniMatch Litho Tool Matching Software". Below the title bar are four tabs: "Settings", "Raw Data" (which is highlighted), "Analysis", and "Options".

The main workspace is divided into several sections:

- Raw Data:** A large circular plot labeled "Wafer 1" showing a vector field of blue arrows. The plot has a coordinate system from -100 to 100 on both axes. A scale bar in the bottom right of the plot indicates "0.024 um".
- Modeling:** A smaller square plot showing a zoomed-in view of the vector field, with a coordinate system from -15 to 15 on both axes.
- Modeling Parameters:** A panel on the right side of the Modeling plot contains the following settings:
 - Raw Data Max Cutoff: []
 - Max Residual Cutoff: []
 - Data Remain Cutoff: 80 %
 - Sigma Cutoff: 3
 - Model DistortionA yellow "Run Model" button is located below these parameters.
- General Statistical Info:** A text box below the Modeling plot displays the following data:

```
-----General Statistical Info-----
Ttl Wfirs      1
Ttl Flds      9
Ttl Sites     315
X             Y             RMS XY
Max +0.0356   +0.0127   +0.0407   Max
Mean +0.0119   -0.0134   +0.0225   Mean
Medn +0.0119   -0.013   +0.0241   Medn
Min -0.00994   -0.0384   +0.00189   Min
Std +0.0113   +0.012   +0.00907   Std
```

At the bottom of the interface, there are two main control panels:

- Import Data:** Includes a "Select Wafer" dropdown menu set to "1", a text field "No scan direction data loaded", and two buttons: "Open Overlay Data" and "Open Step/Scan Map".
- Plot Options:** Includes a "Plot Field" dropdown menu set to "Average", a "VectorScale" input field set to "0.024063 um", and a checked "AutoScale" checkbox.

A blue arrow points from a blue callout box to the "Open Overlay Data" button. The callout box contains the text: "Import overlay tool file, step/scan map (optional)".

The status bar at the bottom left shows "File:" and the bottom right shows "Ready" with a green indicator.

Error Removal: X,Y_tran and scaling errors removed, showing rotation and ortho on wafer scale.

OmniMatch Litho Tool Matching Software

Settings | Raw Data | **Analysis** | Options

Analysis

Wafer 1

0.015 um

Modeling

Raw Data Max Cutoff:

Max Residual Cutoff:

Data Remain Cutoff: 80 %

Sigma Cutoff: 3

Model Distortion

Model Type: ASML Scanner

Run Model | Remove Errors

Scale: 0.015 um Auto

std: 0.010

Alignment				Lens				Distortion				Step / Scan			
X,Y_tran	-12.139, 13.331	nm	<input checked="" type="checkbox"/>	R_Rot	-0.159	uRad	<input type="checkbox"/>	Trap	6.798E-013, -6.754E-013	<input type="checkbox"/>	Backlash X	0.824	nm	<input type="checkbox"/>	
X,Y_exp	0.117, 0.140	ppm	<input checked="" type="checkbox"/>	AR_Rot	0.010	uRad	<input type="checkbox"/>	3rd Distor	-6.432E-016, -6.838E-017	<input type="checkbox"/>	Backlash Y	3.462	nm	<input type="checkbox"/>	
Rot	-0.202	uRad	<input type="checkbox"/>	R_Mag	0.211	ppm	<input type="checkbox"/>	5th Distor	1.125E-024, -2.946E-025	<input type="checkbox"/>					
N_Ortho	0.003	uRad	<input type="checkbox"/>	AR_Mag	-0.017	ppm	<input type="checkbox"/>								

ASML Scanner Model

Error Analysis: alignment errors removed, showing reticle rotation and lens errors.

OmniMatch Litho Tool Matching Software

Settings | Raw Data | **Analysis** | Options

Analysis

Wafer 1

0.005 um

Modeling

Raw Data Max Cutoff:

Max Residual Cutoff:

Data Remain Cutoff: 80 %

Sigma Cutoff: 3

Model Distortion

Model Type: ASML Scanner

Run Model | Remove Errors

std: 0.003

Scale: 0.005 um Auto

ASML Scanner Model

Step / Scan	Value	Unit	Checkbox
Backlash X	0.824	nm	<input type="checkbox"/>
Backlash Y	3.462	nm	<input type="checkbox"/>

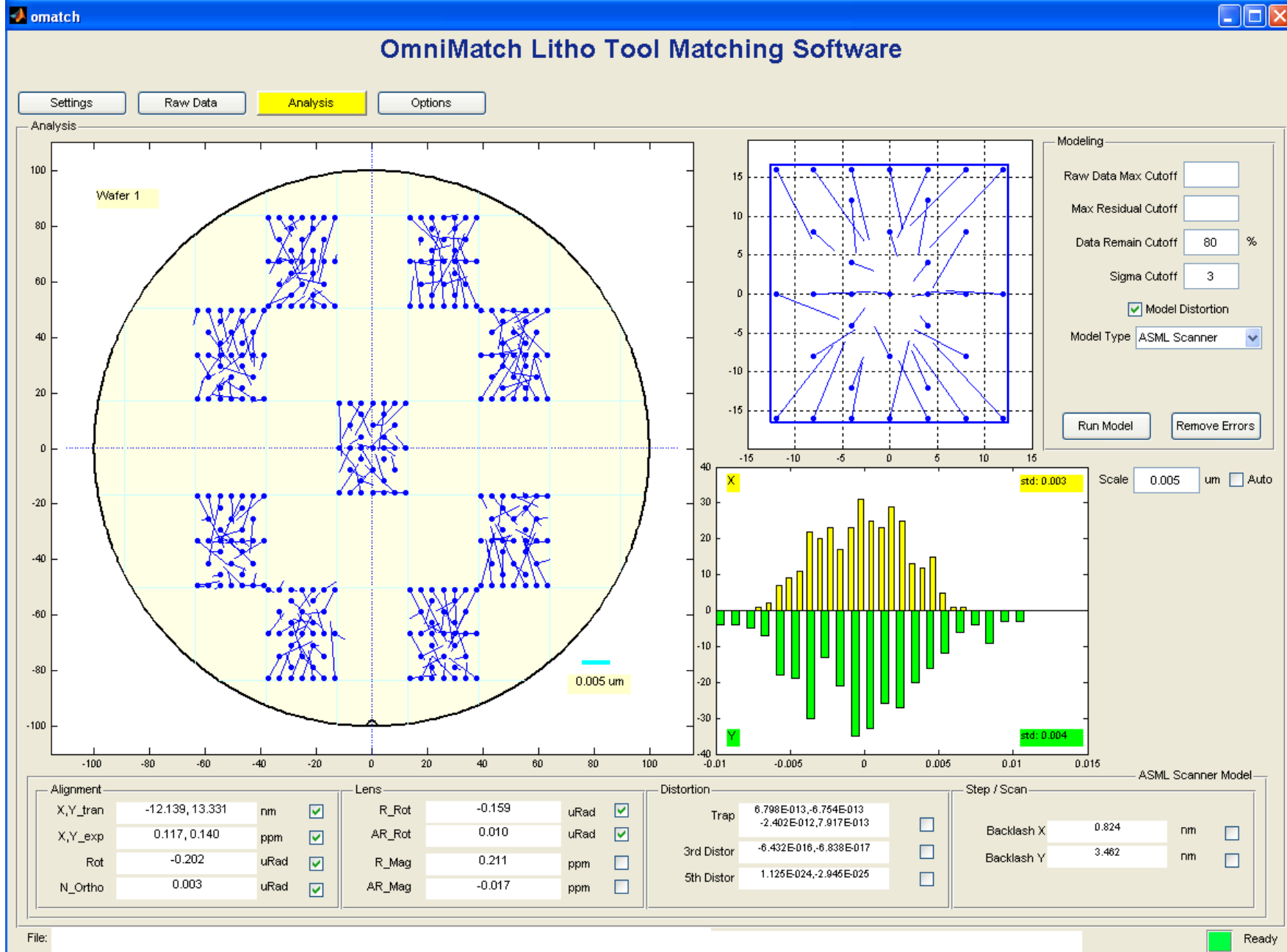
Alignment			
X,Y_tran	-12.139, 13.331	nm	<input checked="" type="checkbox"/>
X,Y_exp	0.117, 0.140	ppm	<input checked="" type="checkbox"/>
Rot	-0.202	uRad	<input checked="" type="checkbox"/>
N_Ortho	0.003	uRad	<input checked="" type="checkbox"/>

Lens			
R_Rot	-0.159	uRad	<input type="checkbox"/>
AR_Rot	0.010	uRad	<input type="checkbox"/>
R_Mag	0.211	ppm	<input type="checkbox"/>
AR_Mag	-0.017	ppm	<input type="checkbox"/>

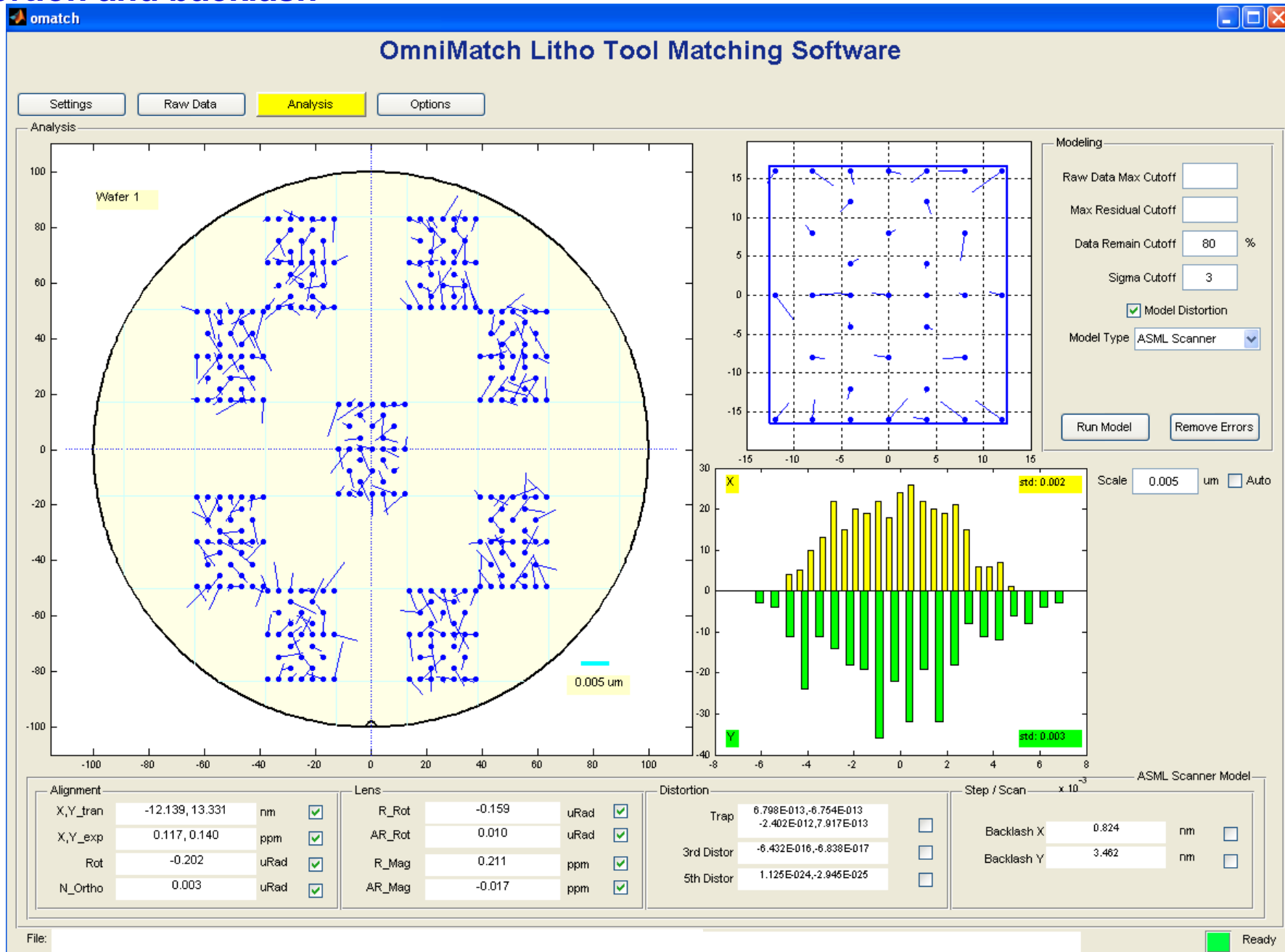
Distortion			
Trap	6.798E-013, -6.754E-013		<input type="checkbox"/>
	-2.402E-012, 7.917E-013		<input type="checkbox"/>
3rd Distor	-6.432E-016, -6.838E-017		<input type="checkbox"/>
5th Distor	1.125E-024, -2.945E-025		<input type="checkbox"/>

File: Ready

Error Removal: align errors and reticle rotation removed, showing lens mag errors.



Error Removal: alignment, lens rotation and mag errors removed, showing distortion and backlash



Error Removal: all model errors removed

omatch OmniMatch Litho Tool Matching Software

Settings Raw Data **Analysis** Options

Analysis

Wafer 1

0.005 um

Modeling

Raw Data Max Cutoff

Max Residual Cutoff

Data Remain Cutoff %

Sigma Cutoff

Model Distortion

Model Type

std: 0.002

std: 0.002

Scale um Auto

Alignment			
X,Y_tran	-12.139, 13.331	nm	<input checked="" type="checkbox"/>
X,Y_exp	0.117, 0.140	ppm	<input checked="" type="checkbox"/>
Rot	-0.202	uRad	<input checked="" type="checkbox"/>
N_Ortho	0.003	uRad	<input checked="" type="checkbox"/>

Lens			
R_Rot	-0.159	uRad	<input checked="" type="checkbox"/>
AR_Rot	0.010	uRad	<input checked="" type="checkbox"/>
R_Mag	0.211	ppm	<input checked="" type="checkbox"/>
AR_Mag	-0.017	ppm	<input checked="" type="checkbox"/>

Distortion			
Trap	6.798E-013, -6.754E-013		<input checked="" type="checkbox"/>
	-2.402E-012, 7.917E-013		<input checked="" type="checkbox"/>
3rd Distor	-6.432E-016, -6.838E-017		<input checked="" type="checkbox"/>
5th Distor	1.125E-024, -2.945E-025		<input checked="" type="checkbox"/>

Step / Scan $\times 10^{-3}$			
Backlash X	0.824	nm	<input checked="" type="checkbox"/>
Backlash Y	3.462	nm	<input checked="" type="checkbox"/>

ASML Scanner Model