GenISys
Advancing the Standard

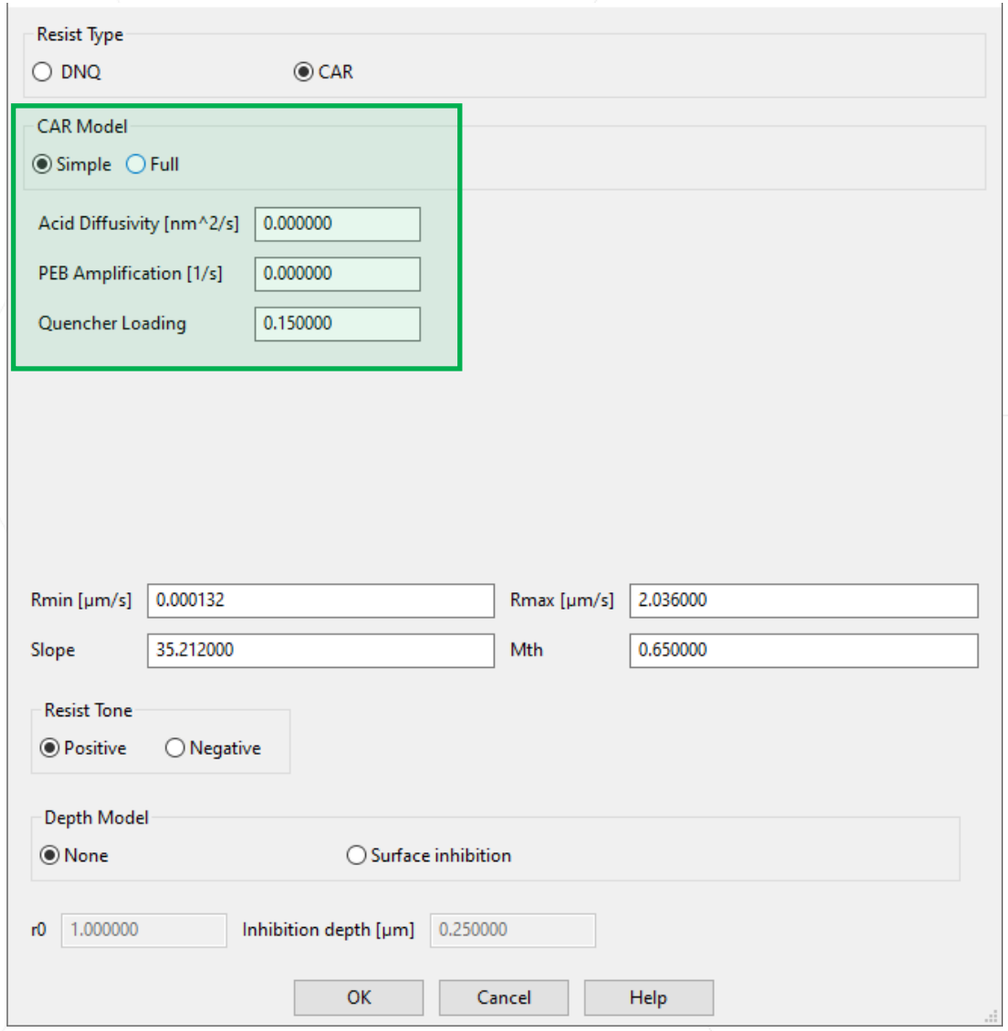
LAB

What‘s new v5.10

Simplified CAR Model

Simplified CAR Model

- CAR resist modelling requires a Post Exposure Bake (PEB) process simulation. The complete parameter set in older LAB versions are kept in the Full model.
- The new simple CAR model removes PEB temperature dependence and reduces the PEB parameters to only three:
  - Acid diffusivity
  - PEB amplification
  - Quencher loading
- Simple CAR model facilitates resist calibration while valid for many resists.

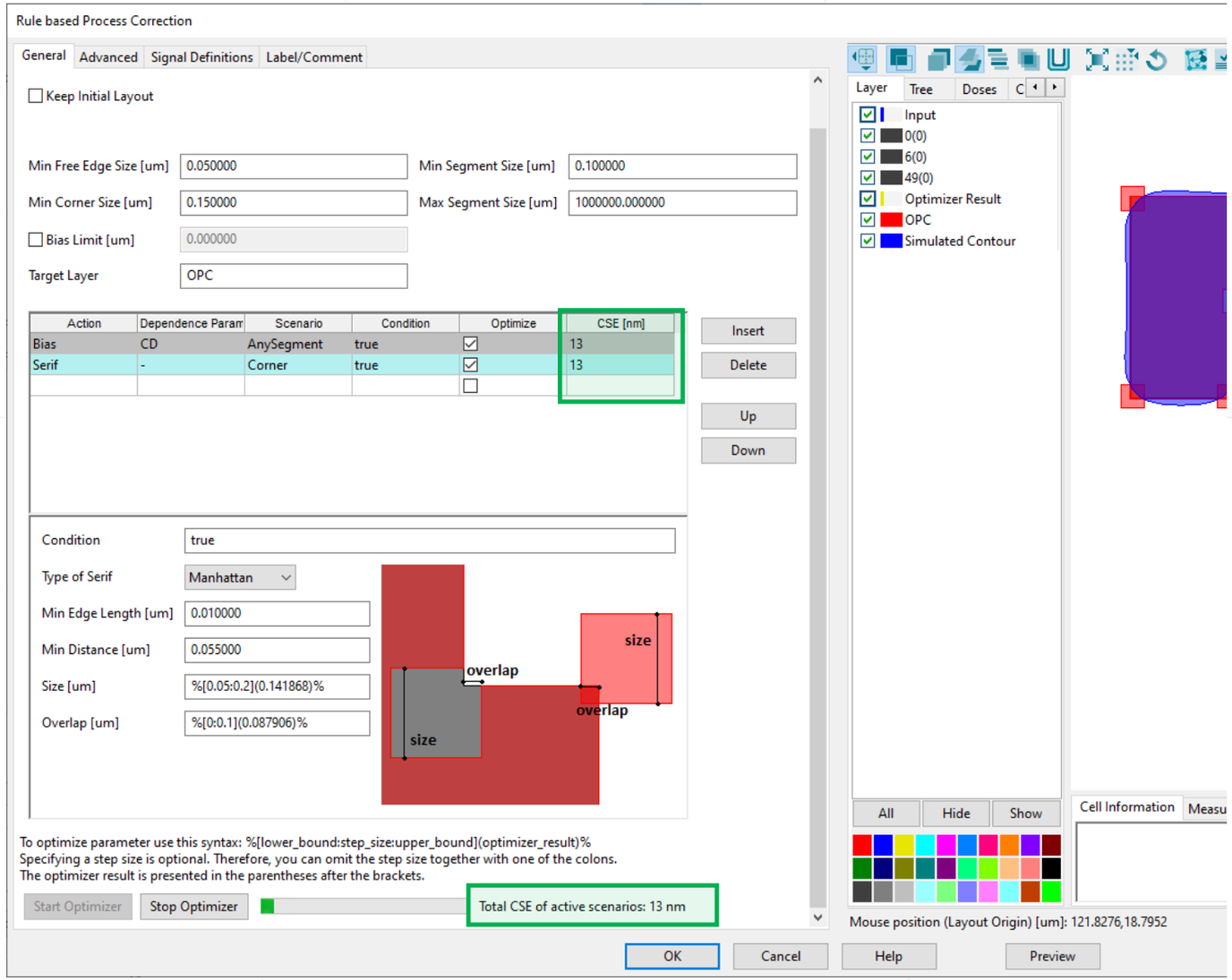


Rule OPC Optimizer

OPC Rule Optimization

Critical Shape Error (CSE) is activated for optimization of OPC rules.

- CSE is the average deviation between the simulated contour and target contour. CSE = 0 means no difference between the resulting shape and target.
- CSE for each OPC rule is calculated as well as a total CSE for all applied OPC rules.
- Please refer to the LAB manual for CSE definition in details.

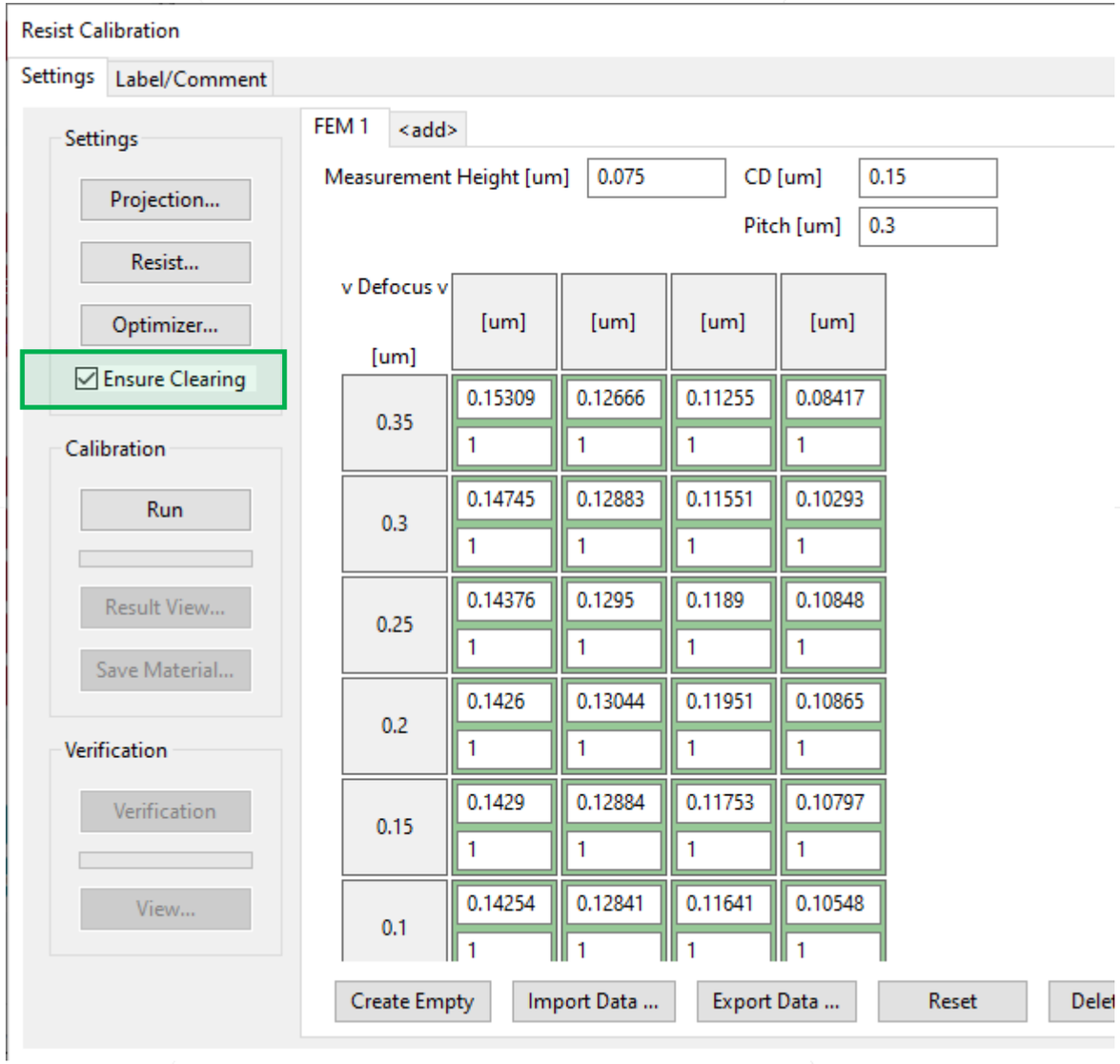


Improved Resist Calibration

Resist Clearing in Calibration

In Resist Calibration, *Ensure Clearing* adds a condition to ensure a proper resist profile

- Previously the only condition was a CD measurement not considering the resist shape above or below the measurement line
- With this new condition, only clearing parameter sets are considered as solution

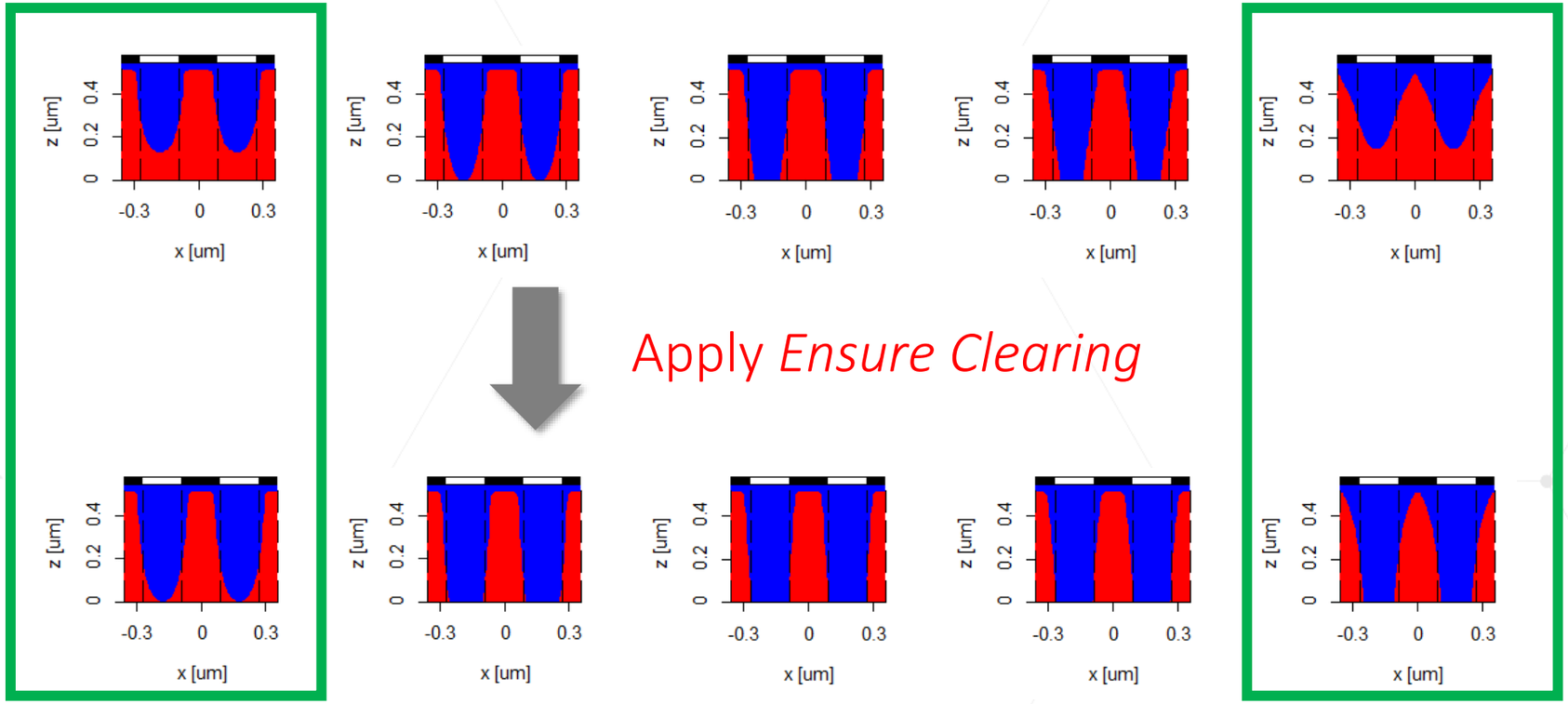


Resist Clearing in Calibration

Example of resist clearing in calibration

- The condition “ensure clearing” is fulfilled, if the resist contour touches the substrate surface in at least on position within the simulation region.

Simulated resist Profile in calibration

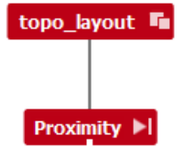


Topogaphy Stack 3D View

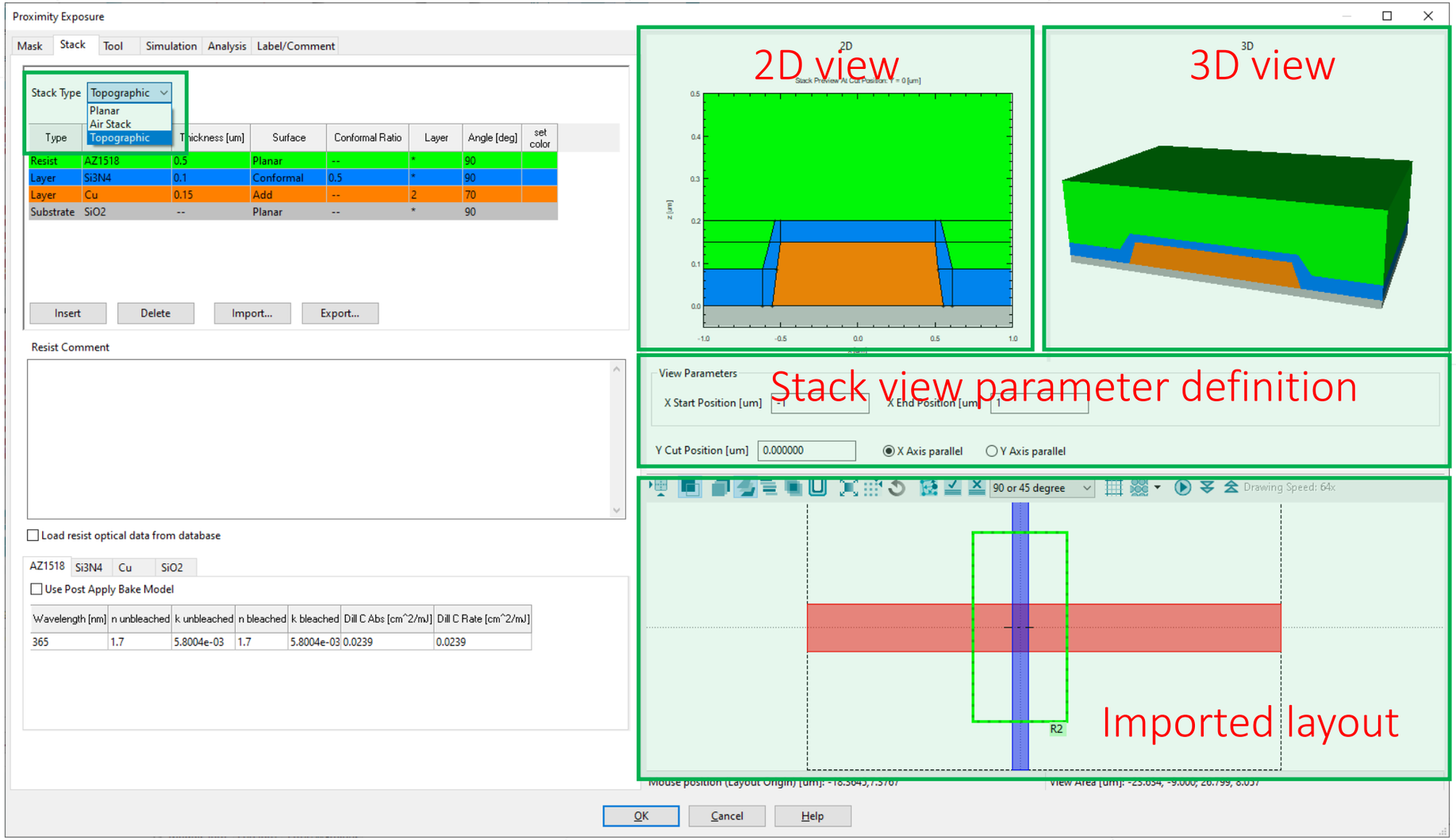
Topography Stack 3D View

3D view of topography stack

- The stack 3D view is available after importing the layout.



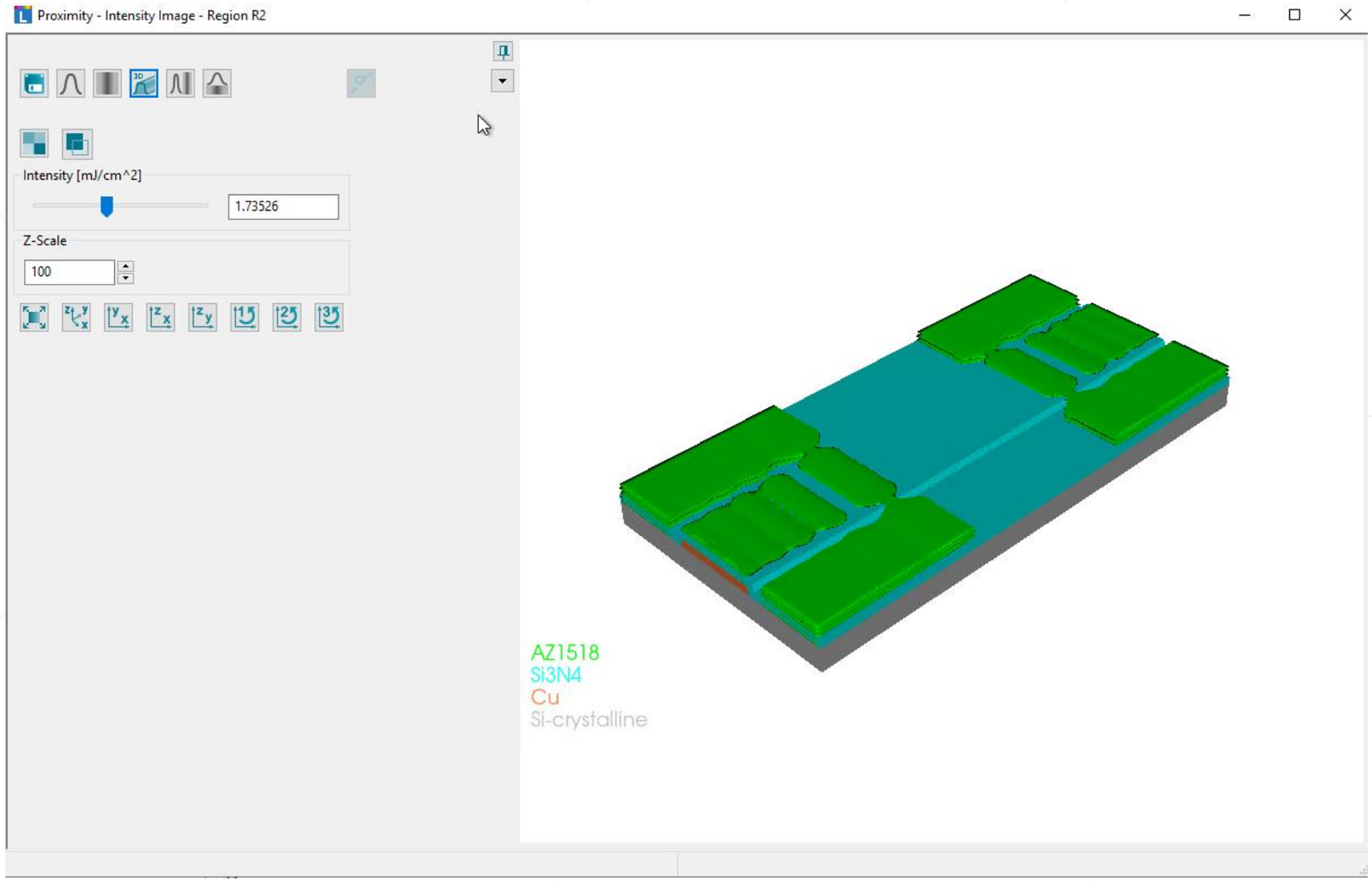
- Selection of Stack Type „Topographic“ opens the viewer.



Result 3D View

3D view of topography result

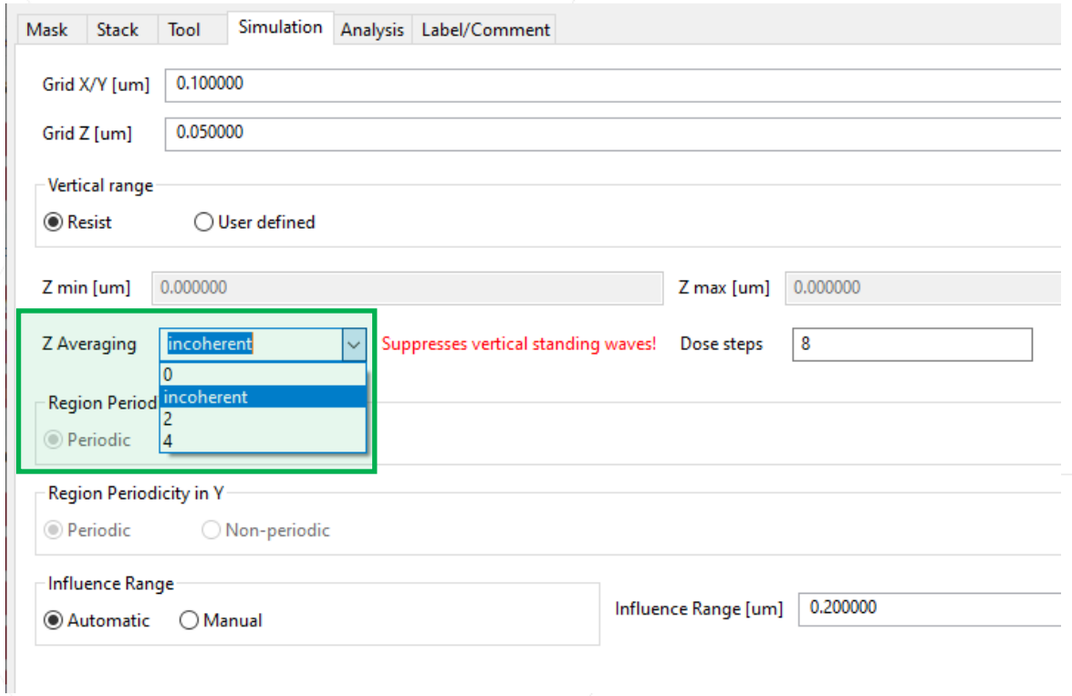
- 3D images of both bulk intensity and resist profile are available



Thick Resist Simulation

Incoherent Z Averaging

- Thick resist simulation has a heavy demands on memory and simulation time.
- This requires a relative large Grid Z value, which can cause sampling errors in cases with standing wave effects.
- Incoherent Z averaging is introduced to suppress the standing wave effect while keeping high accuracy in intensity simulation.

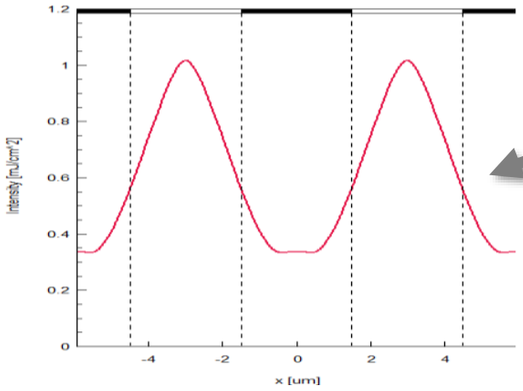


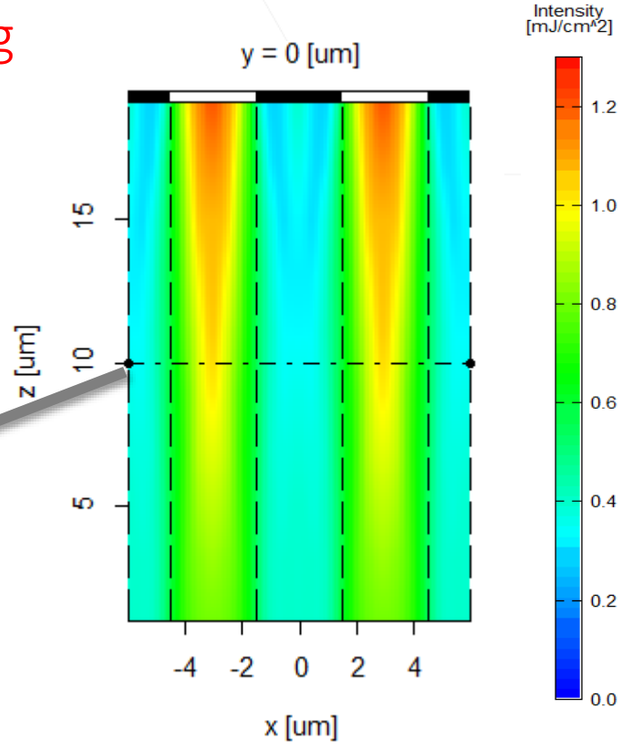
Incoherent Z-Averaging

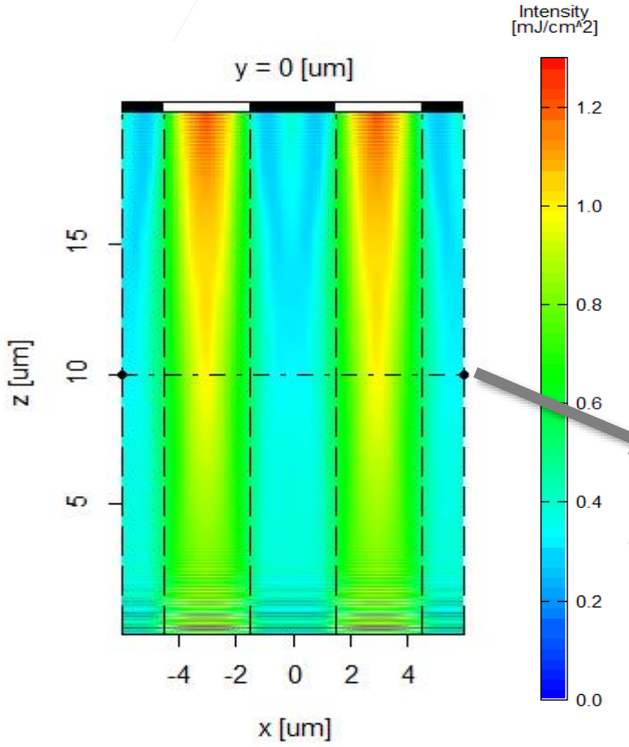
Simulation example for SU8 with 20 µm thickness

- Incoherent Z-averaging has comparable simulation result with no Z-averaging, with intensity deviation within 3.3%.
- Incoherent Z-averaging significantly reduces simulation time.

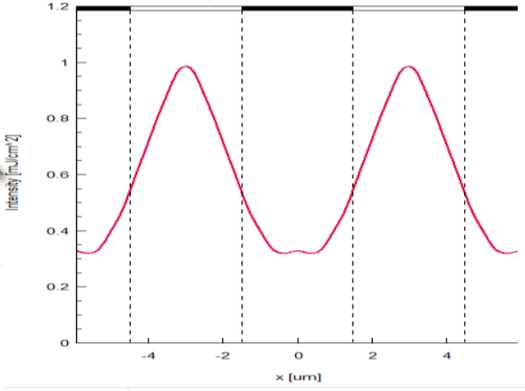
Incoherent Z -averaging
Grid Z = 2 µm
CPU time: 0.11 second







No Z-averaging
Grid Z = 0.01 µm
CPU time: 29.42 second



Thank You!

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