

UseCase.0076 (1.0)

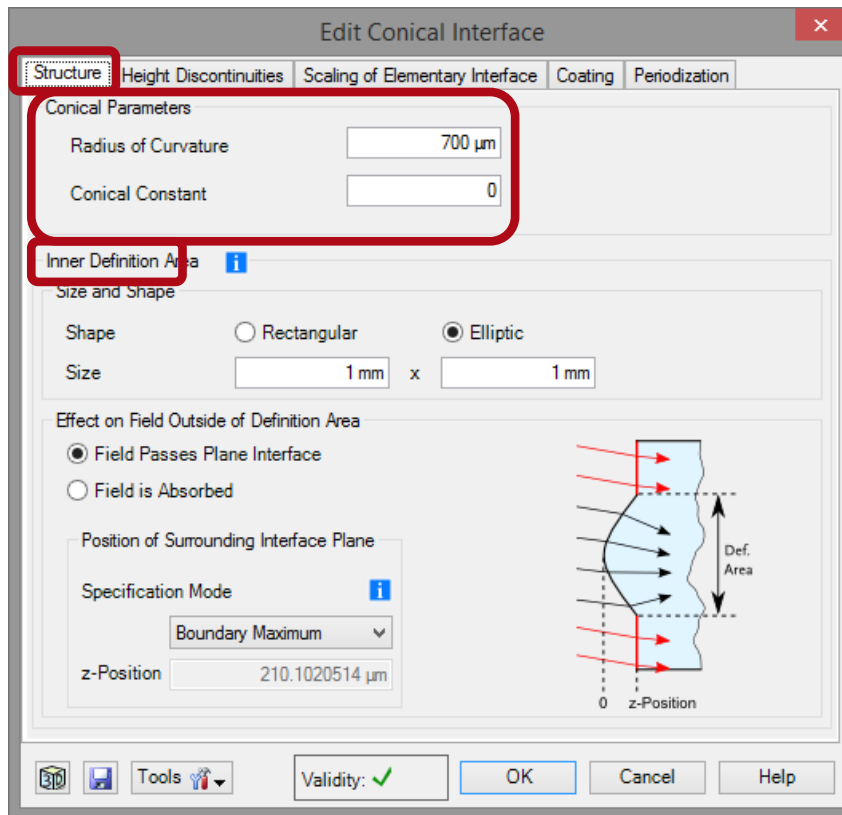
Periodization Options of Optical Interfaces

Keywords: Interface, Periodization, Arrays, Lens, Mirror

Description

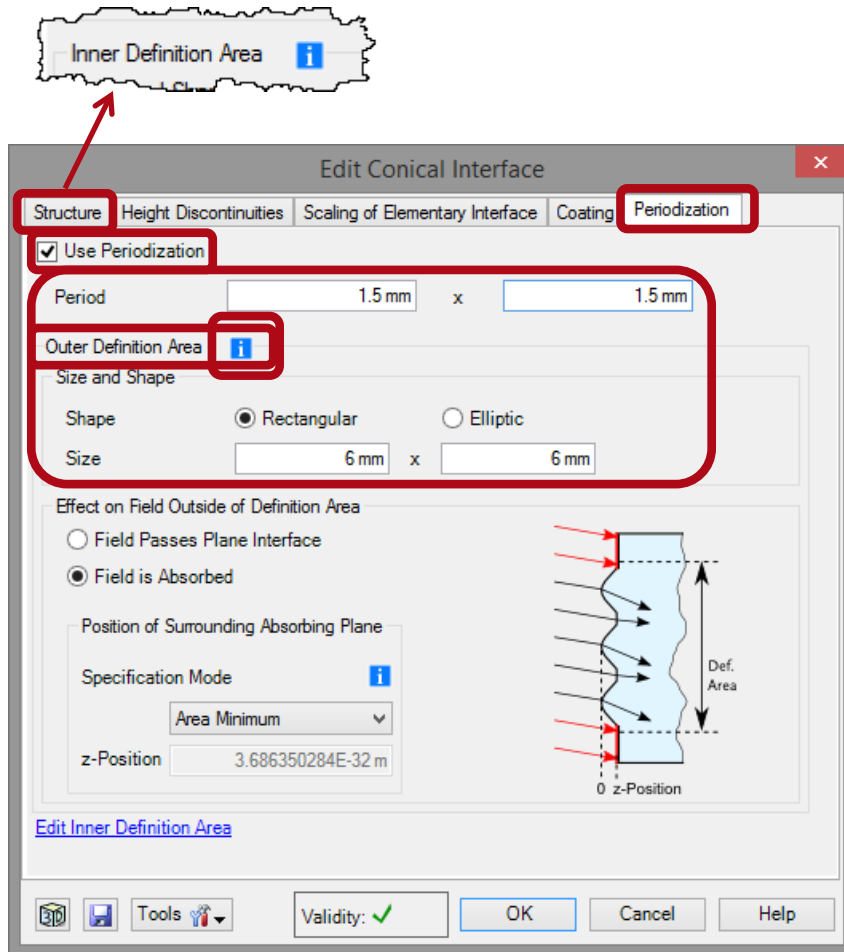
- This use case demonstrates the options of periodization of optical interfaces.
- Any optical interface in VirtualLab can be periodically replicated.
- This option can be used to define e.g. mirror or lens arrays.
- There are several definition areas to define periodic structures.

Typical Edit Dialog of a Surface



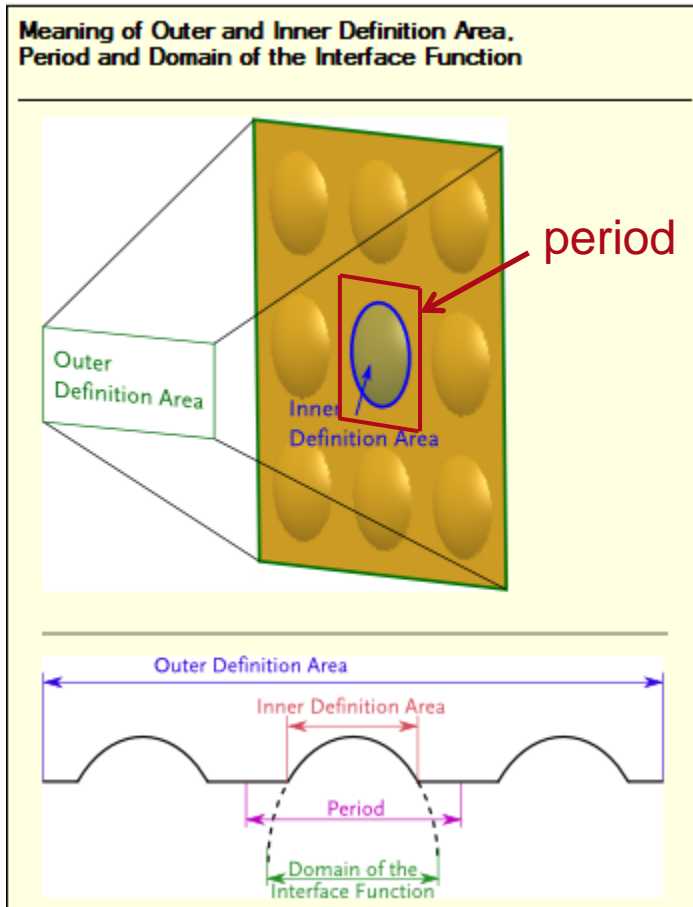
- On the Structure tab the user can configure parameters for the surface type, i.e. the elementary/interface function.
- Also the size and shape is specified for the so-called „Definition Area“.
- The following slides explain the different used terms in more detail.

Periodization Settings



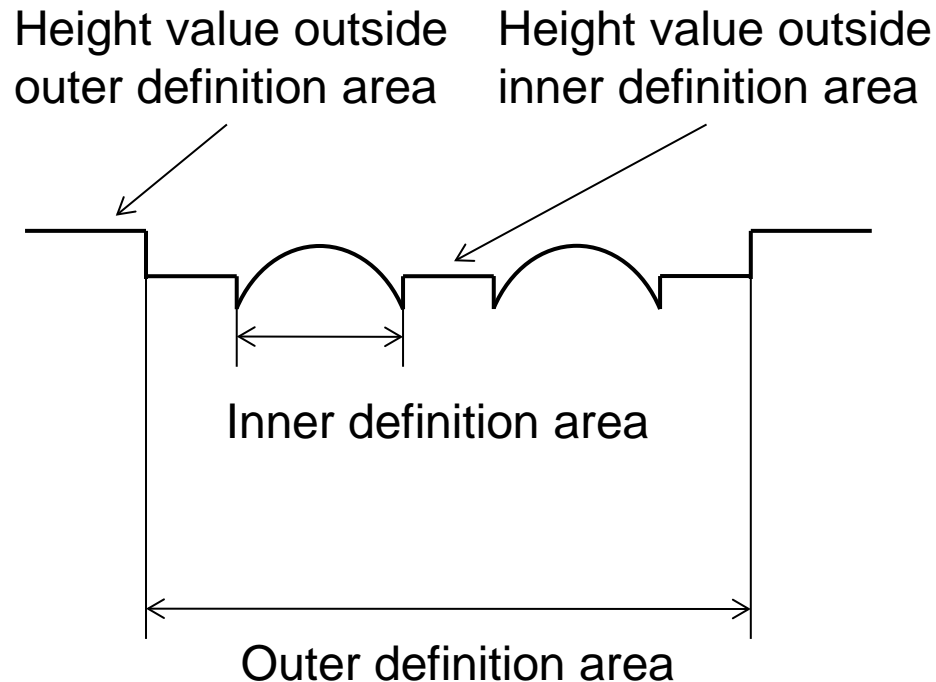
- The moment the periodization is activated via Periodization tab VirtualLab distinguishes between a so-called „Outer Definition Area“ and an „Inner Definition Area“ (before just „Definition Area“).
- On the Periodization tab the size of one period and the Outer Definition Area can be defined.
- Via „i“ icons more information is displayed.

Definitions: Areas



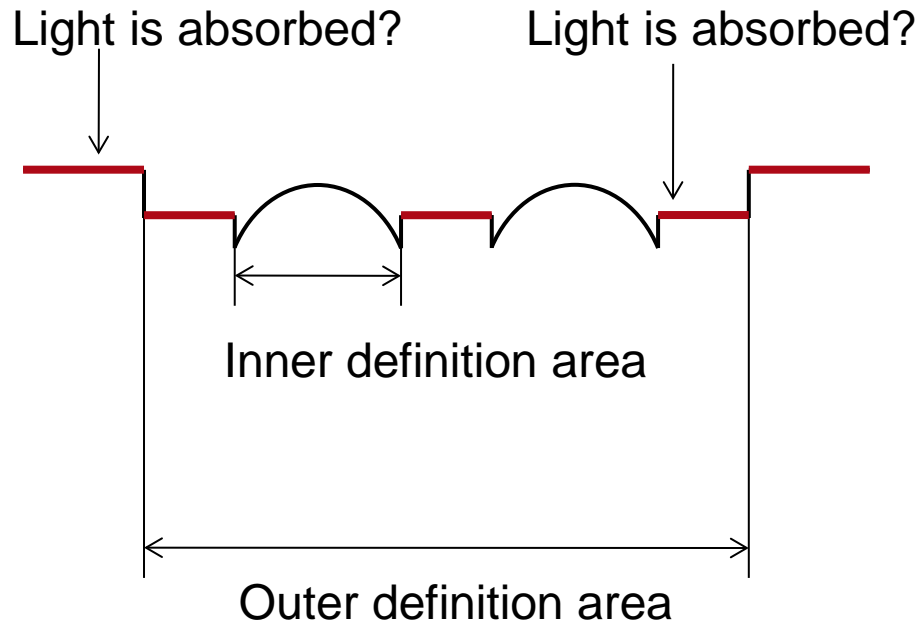
- Inner definition area:
 - Defines the shape and size of one cell of the array.
 - contains height profile defined by structure parameters.
 - The inner definition area can be smaller than the period.
- Outer Definition area: aperture/dimension of the array

Definitions: Heights



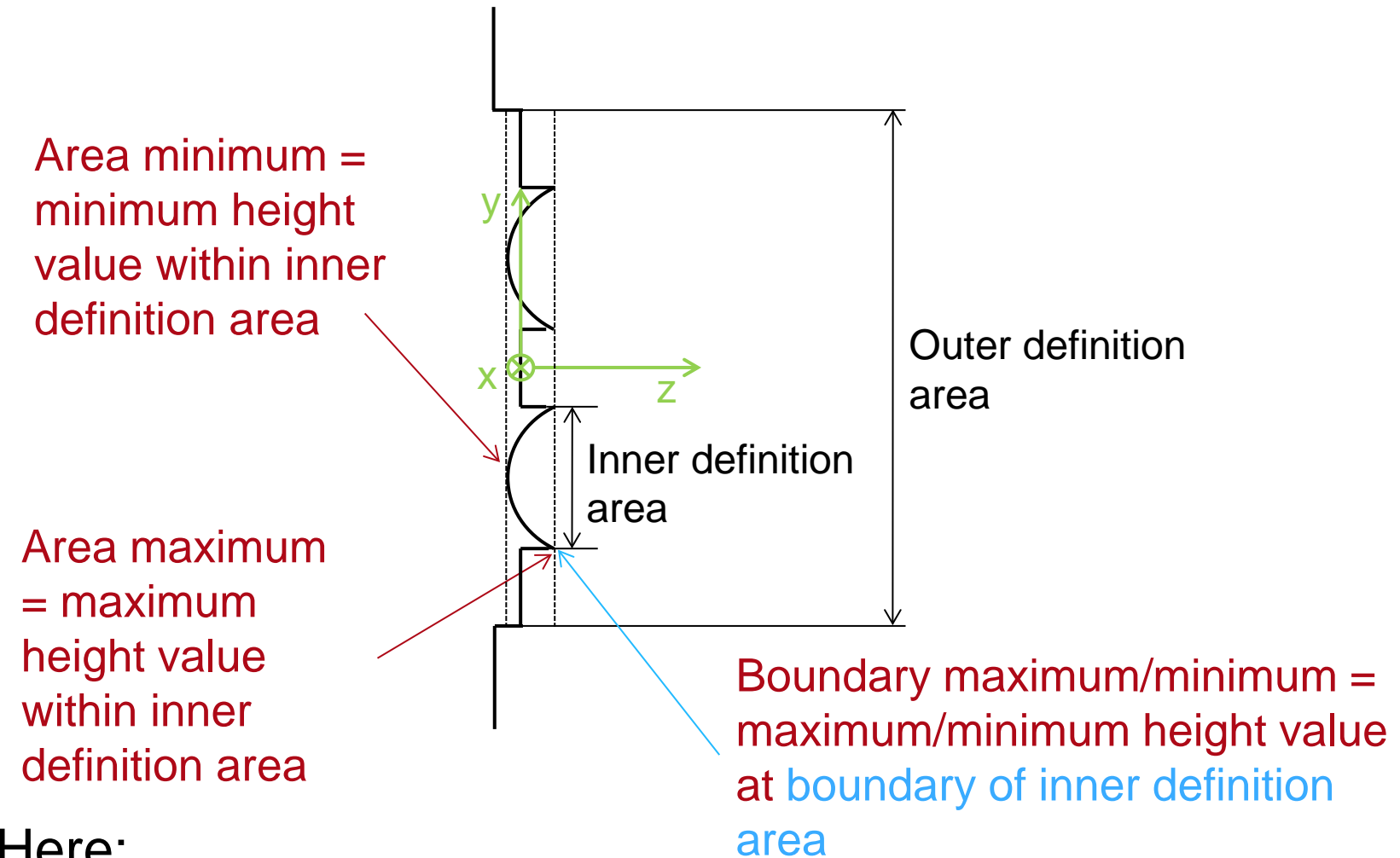
- The height value between the cells (outside of inner definition area) can be controlled by the user.
- Comparable the height value outside of the aperture area (outside of outer definition area) can be controlled.
- The last option is also available for non periodic surfaces.

Definitions: Absorption



- Light can be absorbed in areas between cells (outside of inner definition area) or can pass the surface and is deflected.
- Light can be absorbed outside of array aperture (outside of outer definition area) or can pass the surface and is deflected.
- The last option is also available for non periodic surfaces.

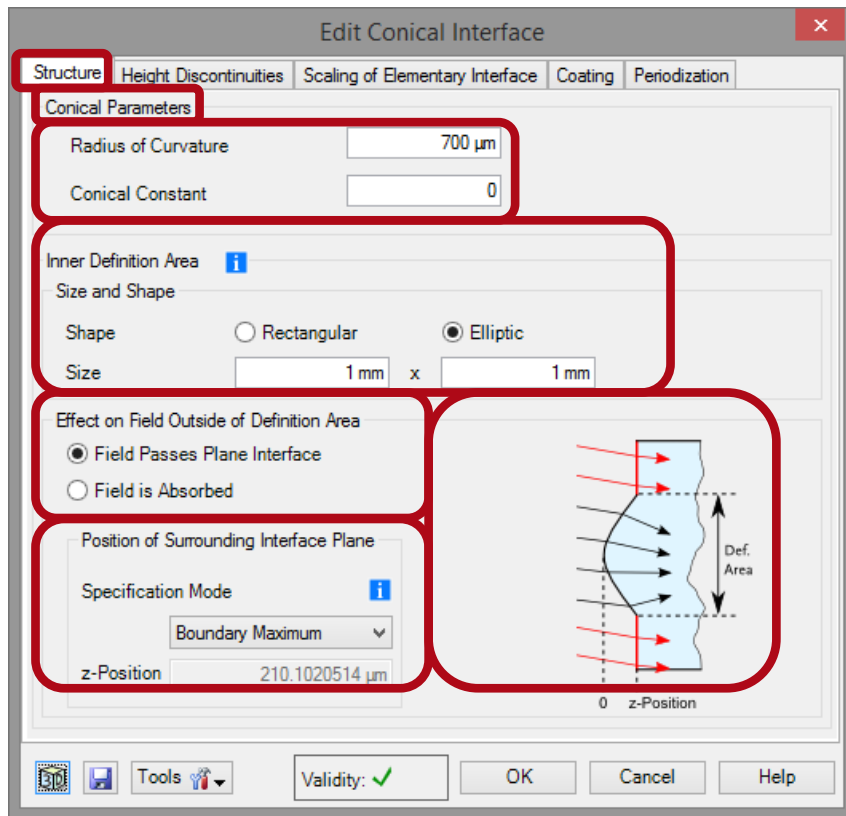
Definitions: References



Here:

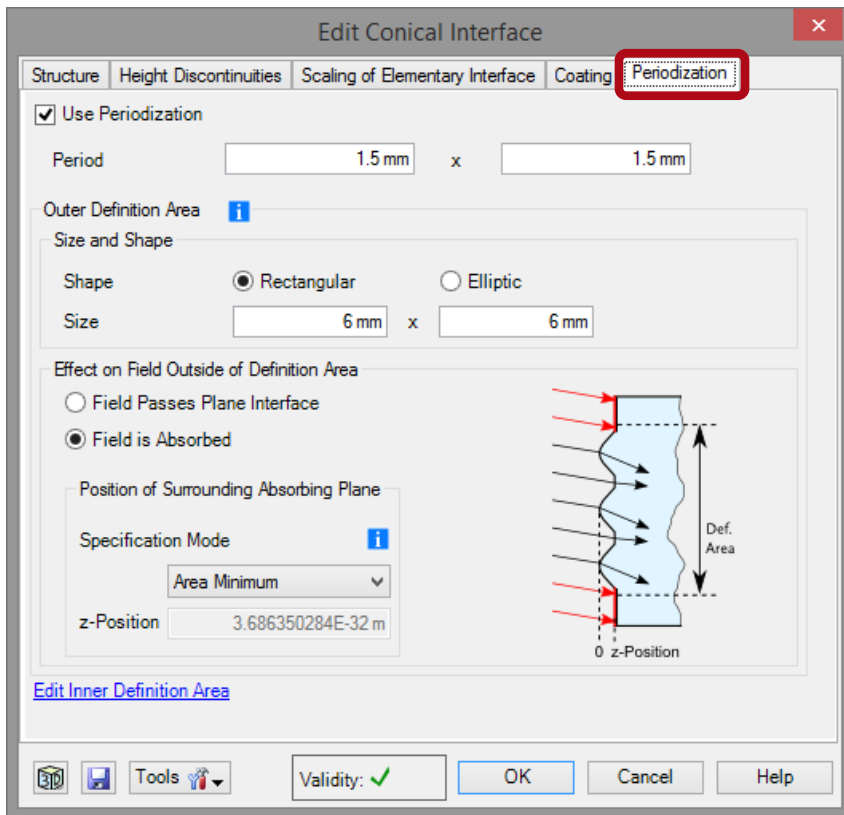
Boundary maximum is the same as the area maximum.

Configurations: Single Structure



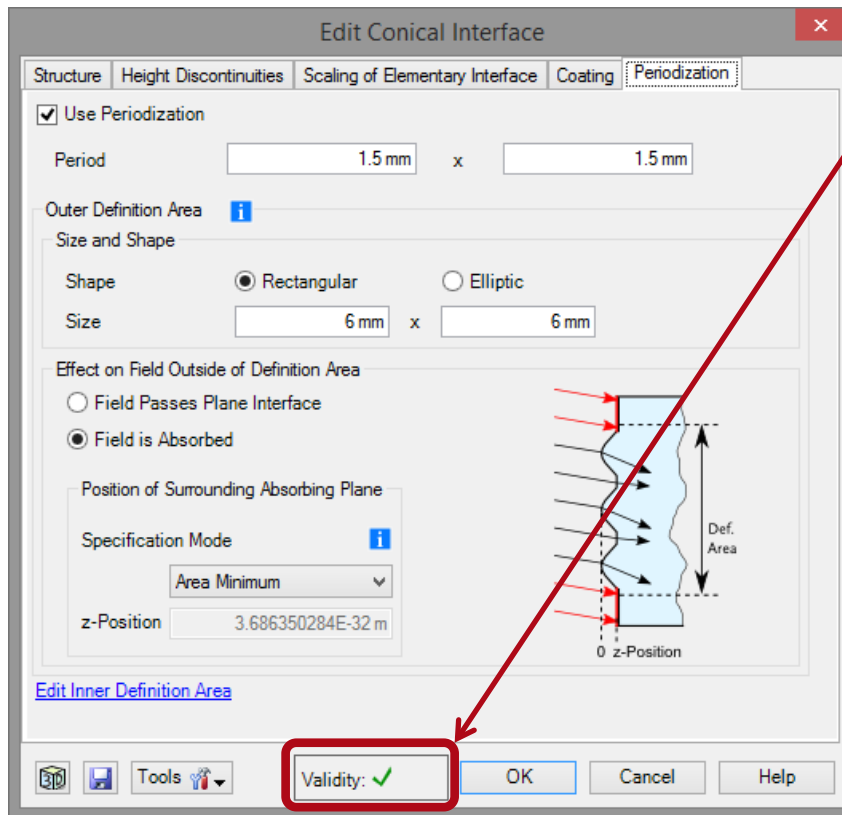
- The structure of an optical interface can be configured in the 'Structure' page.
- Definition of the Radius of Curvature and Conical Constant
- Size and Shape of the inner definition area
- Selection if light can pass the region outside of the inner definition area.
- Height value outside the inner definition area.

Configurations: Periodization



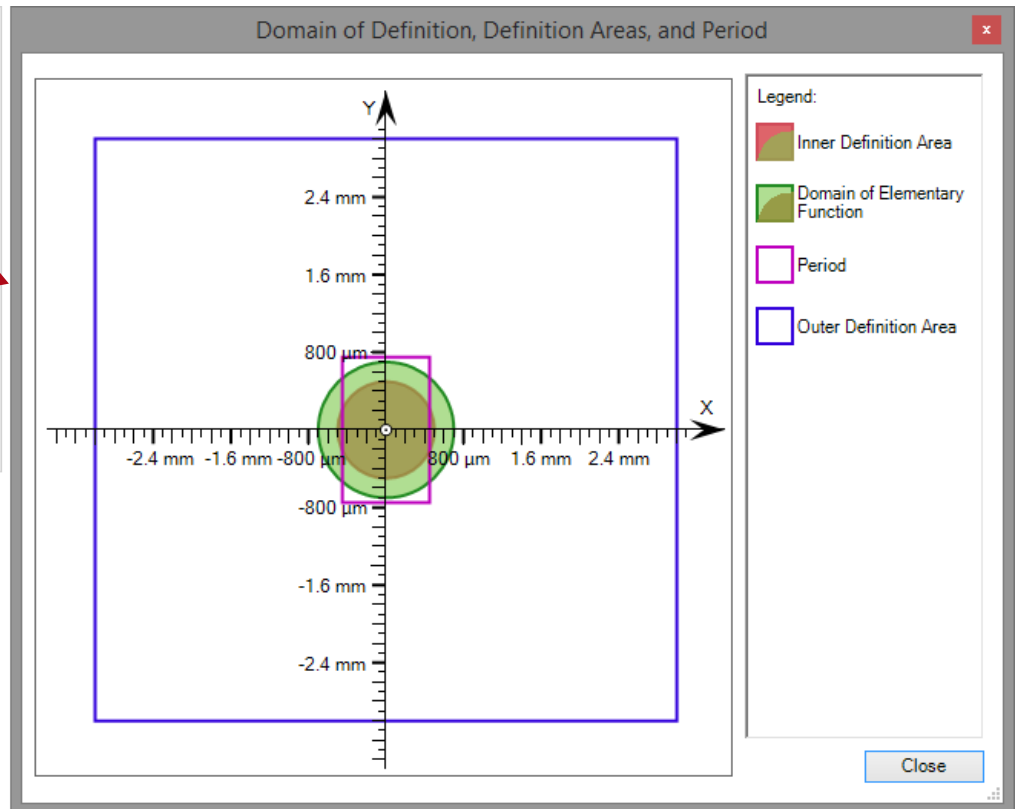
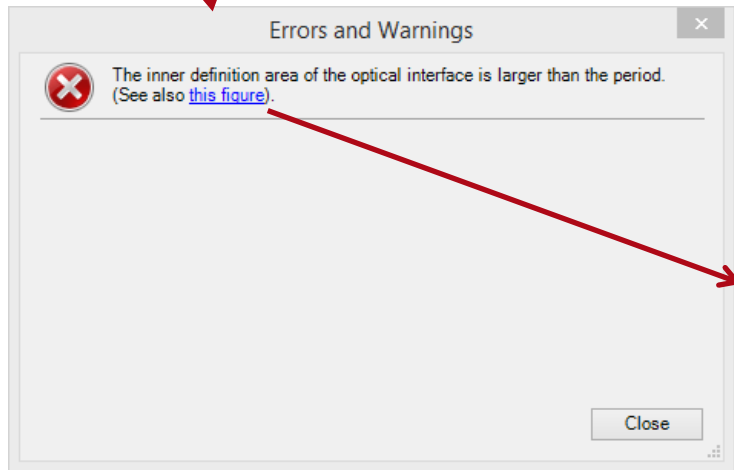
- A periodization of an optical interface can be activated in the 'Periodization' page.
- Definition of period.
- Size and shape of the outer definition area.
- Selection if light can pass the region outside of the outer definition area.
- Height value outside the outer definition area.

Validity of Parameters

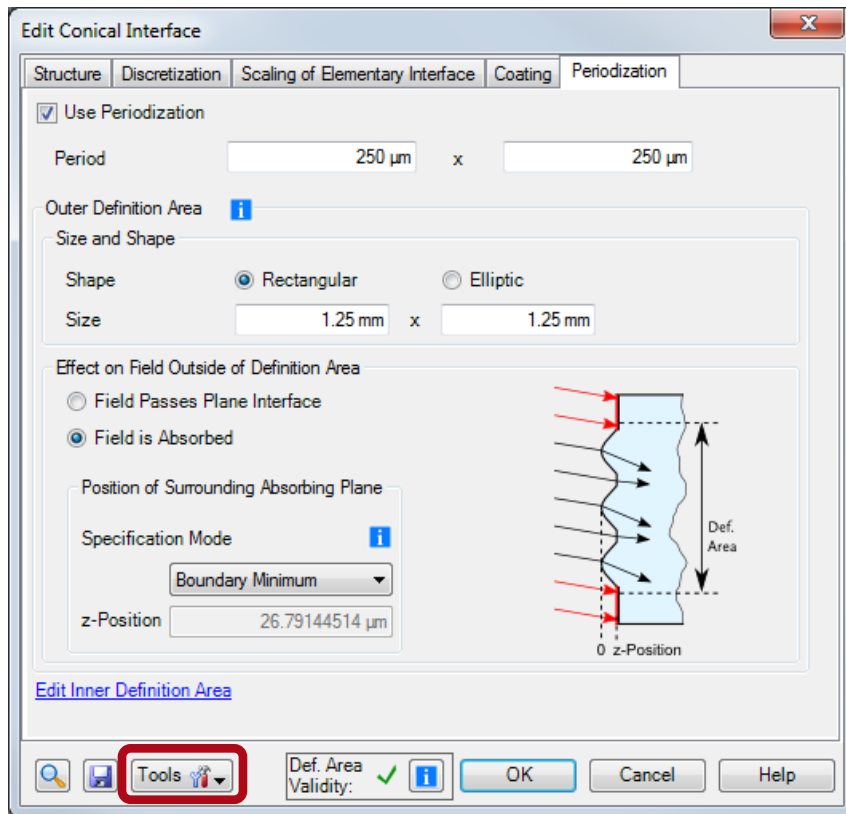


- The dialog shows if all settings are consistent (green checkmark).
- In case of a wrong setting (red cross) clicking the “i” icon gives more information about the misadjustment.

Validity of Parameters: Schematic



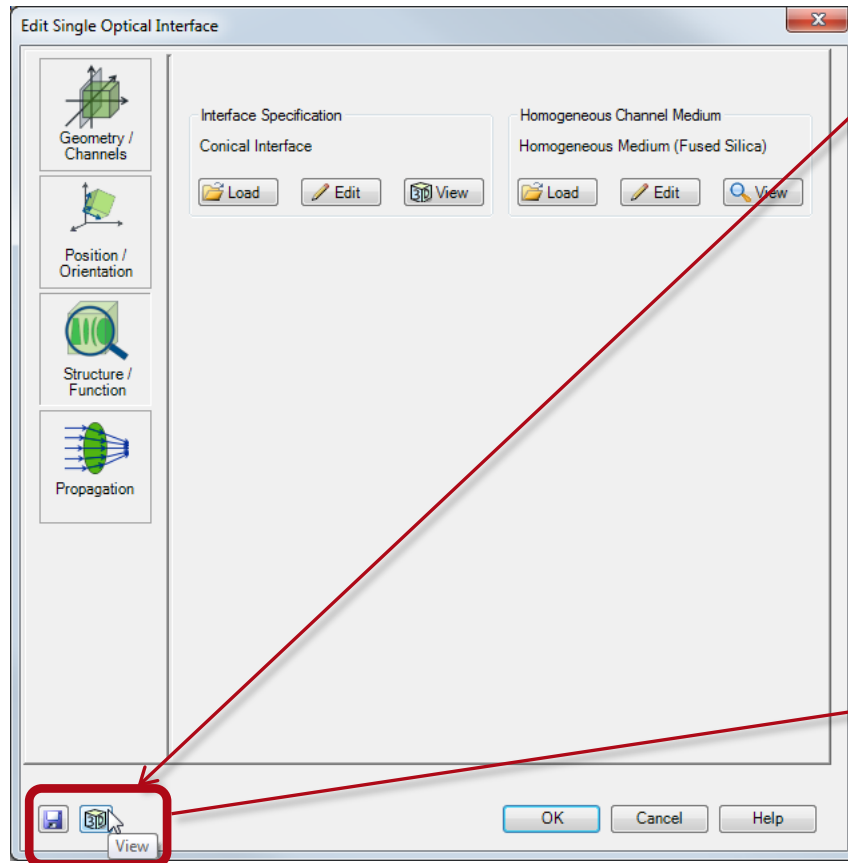
Interface Tools



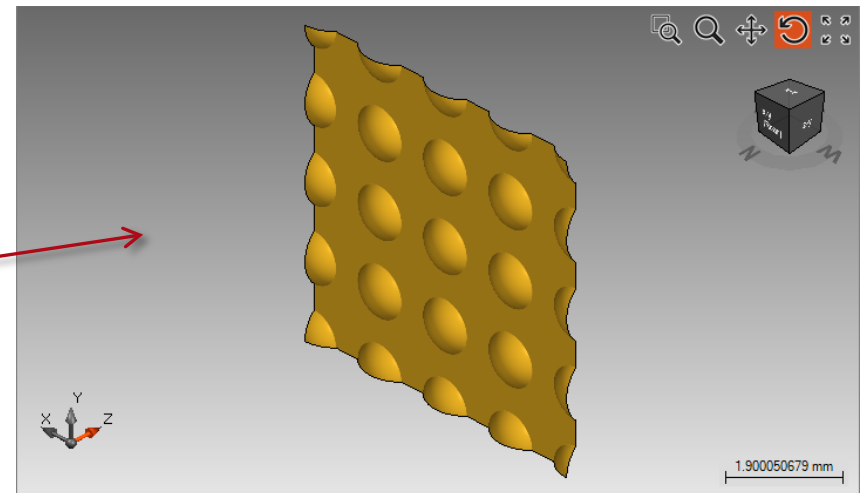
Interface tools allow to:

- Import surface profile
- Export surface profile
- Save to catalog
- View surface

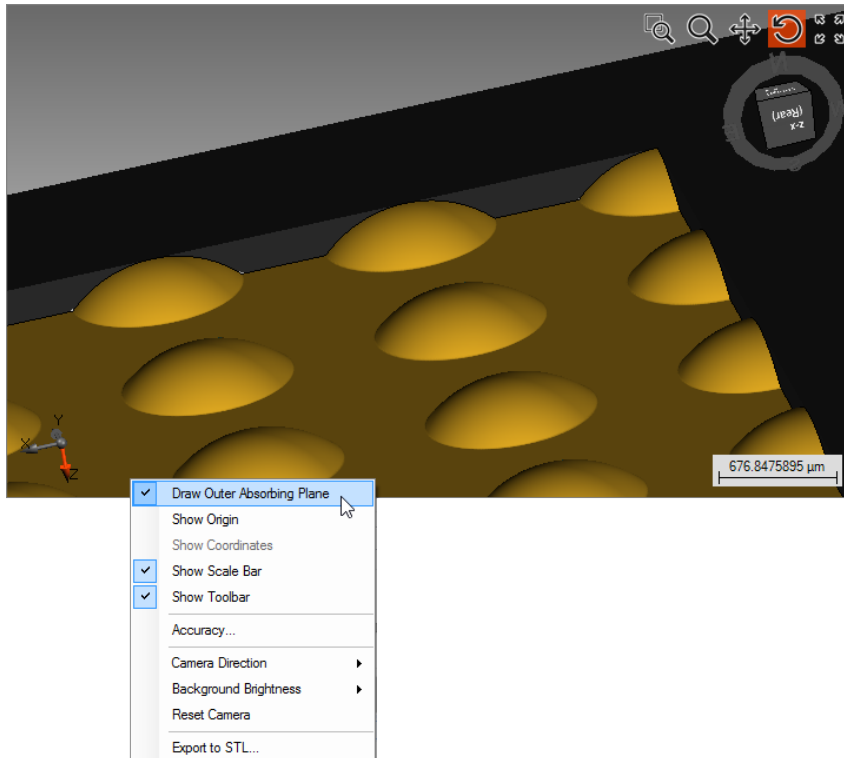
3D View



By clicking on the 3D-View icon an illustration of the set optical component is shown.



3D View: Options



- Outer and inner definition area can be displayed.
- Absorbing areas are marked in black.
- Context menu allows to enable drawing of outer definition area.
- Accuracy factor can increase display resolution.

Summary

- Any optical interface can be periodically replicated to generate arbitrary array structures.
- Inner and outer definition arrays allow definition of complex array structures.
- Example for the simulation of an high NA lens array can be found in Application Scenario AppS.0010.