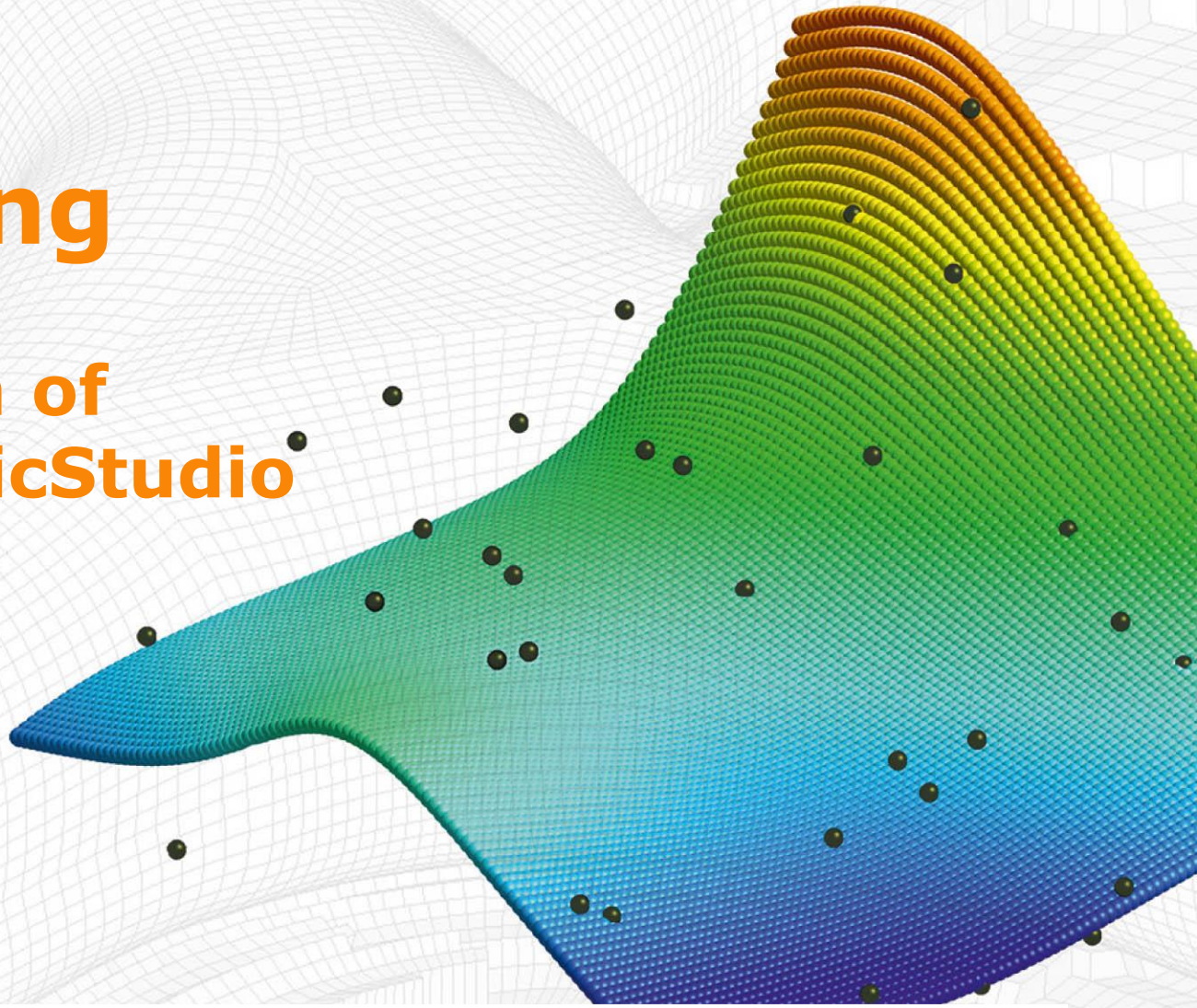
# Example

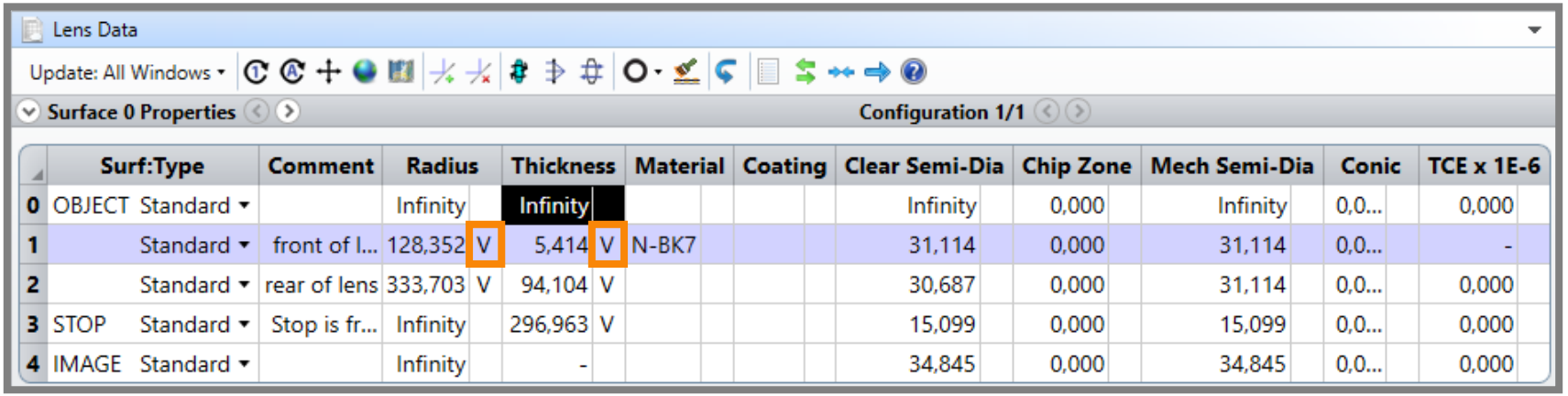
# optiSLang

## Integration of Zemax OpticStudio



# Zemax parametrization

- Open Zemax project
- Zemax Lens Data Editor: Define input parameters that should be varied in optiSLang with “V”


Lens Data

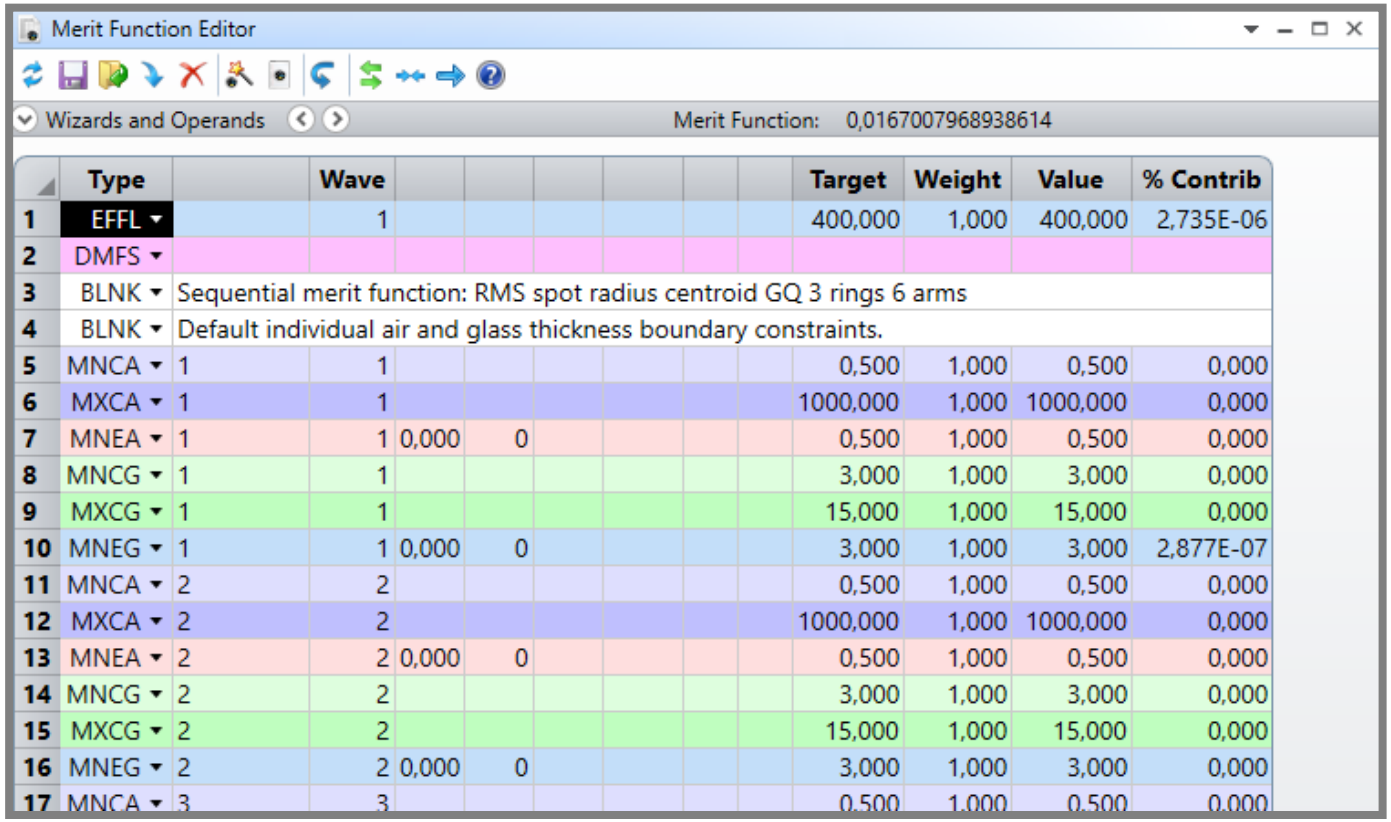
Update: All Windows

Surface 0 Properties — Configuration 1/1

| | Surf:Type | | Comment | Radius | | Thickness | | Material | Coating | Clear Semi-Dia | Chip Zone | Mech Semi-Dia | Conic | TCE x 1E-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | OBJECT | Standard | | Infinity | | Infinity | | | | Infinity | 0,000 | Infinity | 0,0... | 0,000 |
| 1 | | Standard | front of l... | 128,352 | V | 5,414 | V | N-BK7 | | 31,114 | 0,000 | 31,114 | 0,0... | - |
| 2 | | Standard | rear of lens | 333,703 | V | 94,104 | V | | | 30,687 | 0,000 | 31,114 | 0,0... | 0,000 |
| 3 | STOP | Standard | Stop is fr... | Infinity | | 296,963 | V | | | 15,099 | 0,000 | 15,099 | 0,0... | 0,000 |
| 4 | IMAGE | Standard | | Infinity | | - | | | | 34,845 | 0,000 | 34,845 | 0,0... | 0,000 |

# Zemax parametrization

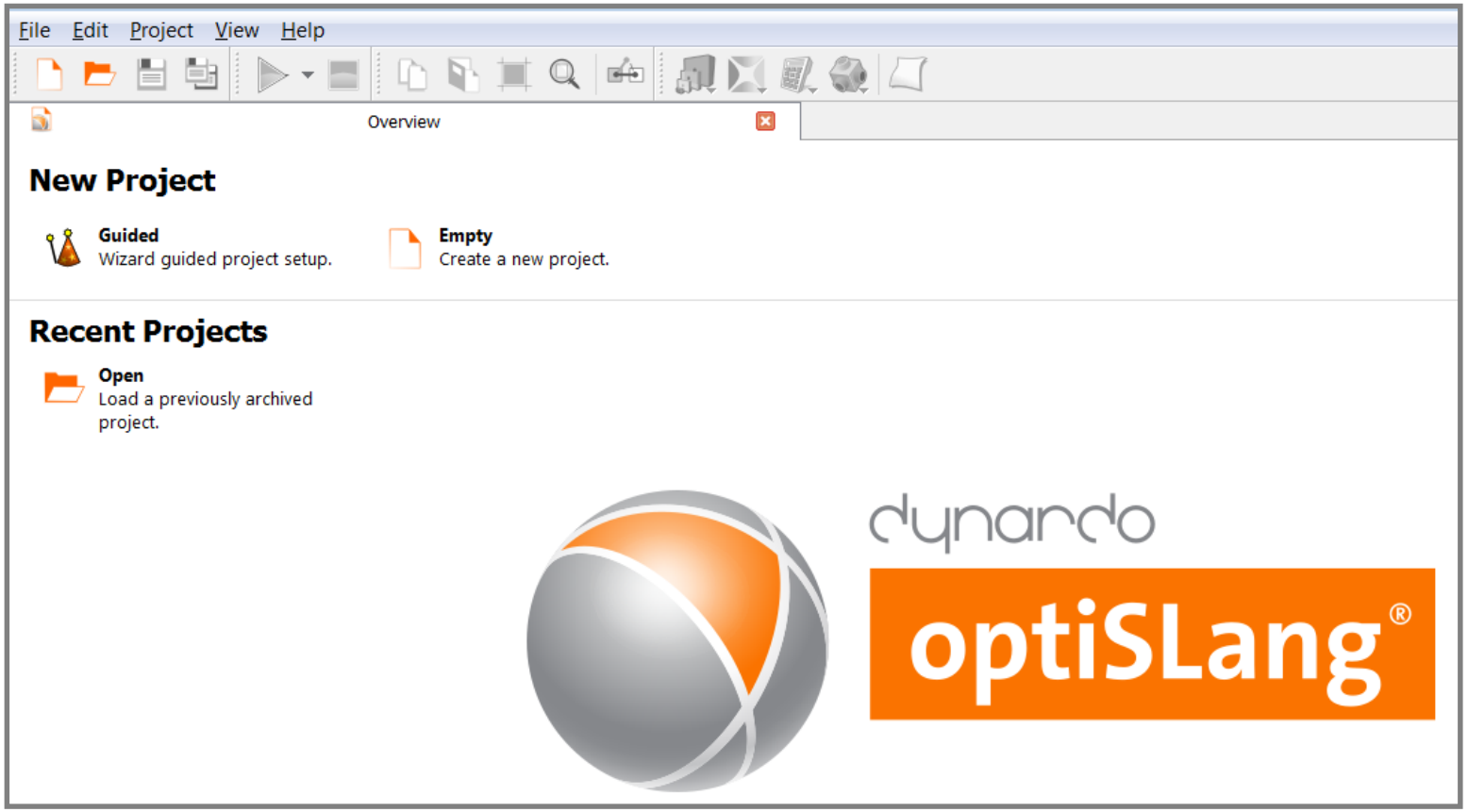
- Define all outputs of the system in Merit Function Editor. Only these can be used in optiSLang for further analysis.




| | Type | | Wave | | | | | | Target | Weight | Value | % Contrib |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | EFFL | | 1 | | | | | | 400,000 | 1,000 | 400,000 | 2,735E-06 |
| 2 | DMFS | | | | | | | | | | | |
| 3 | BLNK | Sequential merit function: RMS spot radius centroid GQ 3 rings 6 arms | | | | | | | | | | |
| 4 | BLNK | Default individual air and glass thickness boundary constraints. | | | | | | | | | | |
| 5 | MNCA | 1 | 1 | | | | | | 0,500 | 1,000 | 0,500 | 0,000 |
| 6 | MXCA | 1 | 1 | | | | | | 1000,000 | 1,000 | 1000,000 | 0,000 |
| 7 | MNEA | 1 | 1 | 0,000 | 0 | | | | 0,500 | 1,000 | 0,500 | 0,000 |
| 8 | MNCG | 1 | 1 | | | | | | 3,000 | 1,000 | 3,000 | 0,000 |
| 9 | MXCG | 1 | 1 | | | | | | 15,000 | 1,000 | 15,000 | 0,000 |
| 10 | MNEG | 1 | 1 | 0,000 | 0 | | | | 3,000 | 1,000 | 3,000 | 2,877E-07 |
| 11 | MNCA | 2 | 2 | | | | | | 0,500 | 1,000 | 0,500 | 0,000 |
| 12 | MXCA | 2 | 2 | | | | | | 1000,000 | 1,000 | 1000,000 | 0,000 |
| 13 | MNEA | 2 | 2 | 0,000 | 0 | | | | 0,500 | 1,000 | 0,500 | 0,000 |
| 14 | MNCG | 2 | 2 | | | | | | 3,000 | 1,000 | 3,000 | 0,000 |
| 15 | MXCG | 2 | 2 | | | | | | 15,000 | 1,000 | 15,000 | 0,000 |
| 16 | MNEG | 2 | 2 | 0,000 | 0 | | | | 3,000 | 1,000 | 3,000 | 0,000 |
| 17 | MNCA | 3 | 3 | | | | | | 0,500 | 1,000 | 0,500 | 0,000 |

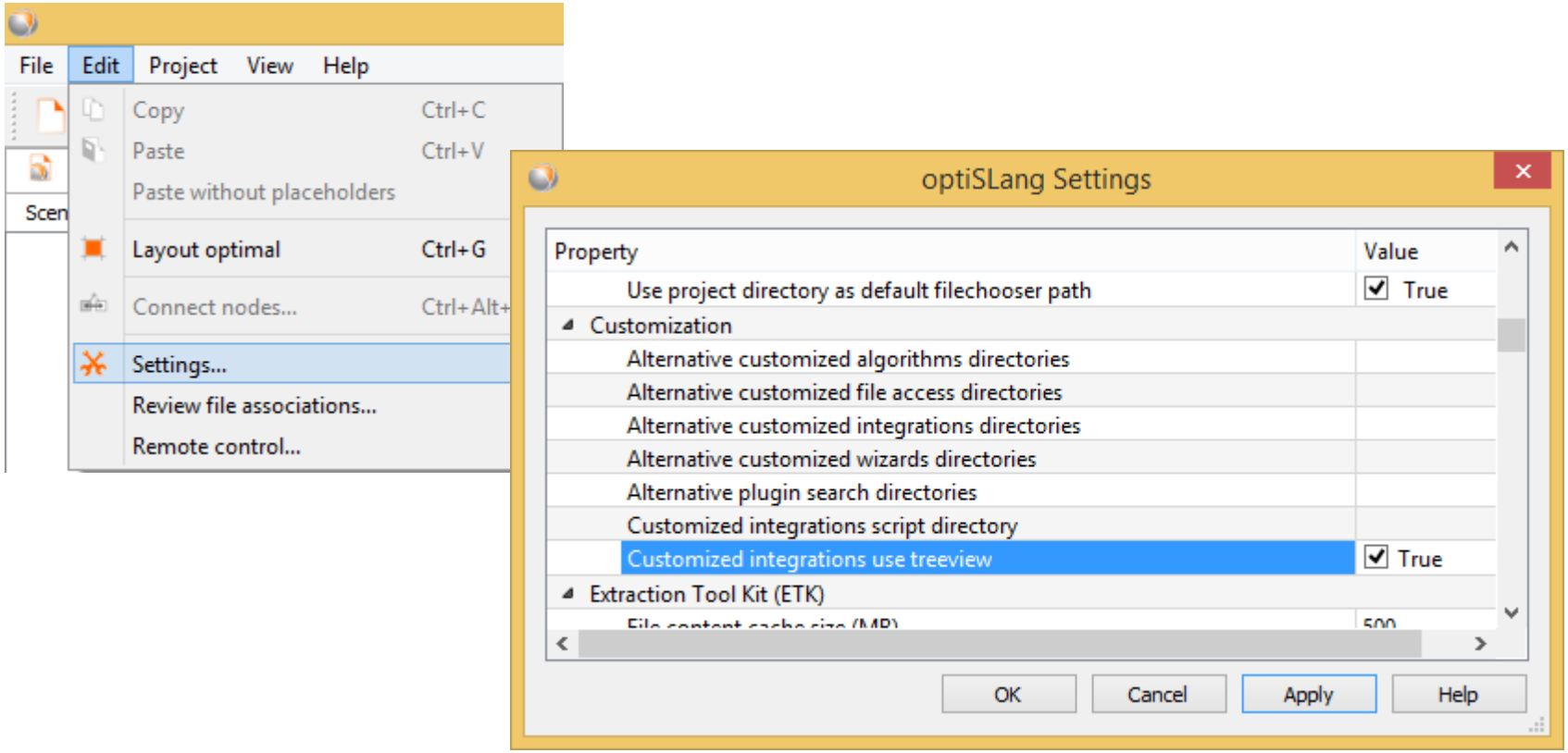
# Settings for more convenience

1. Open optiSLang



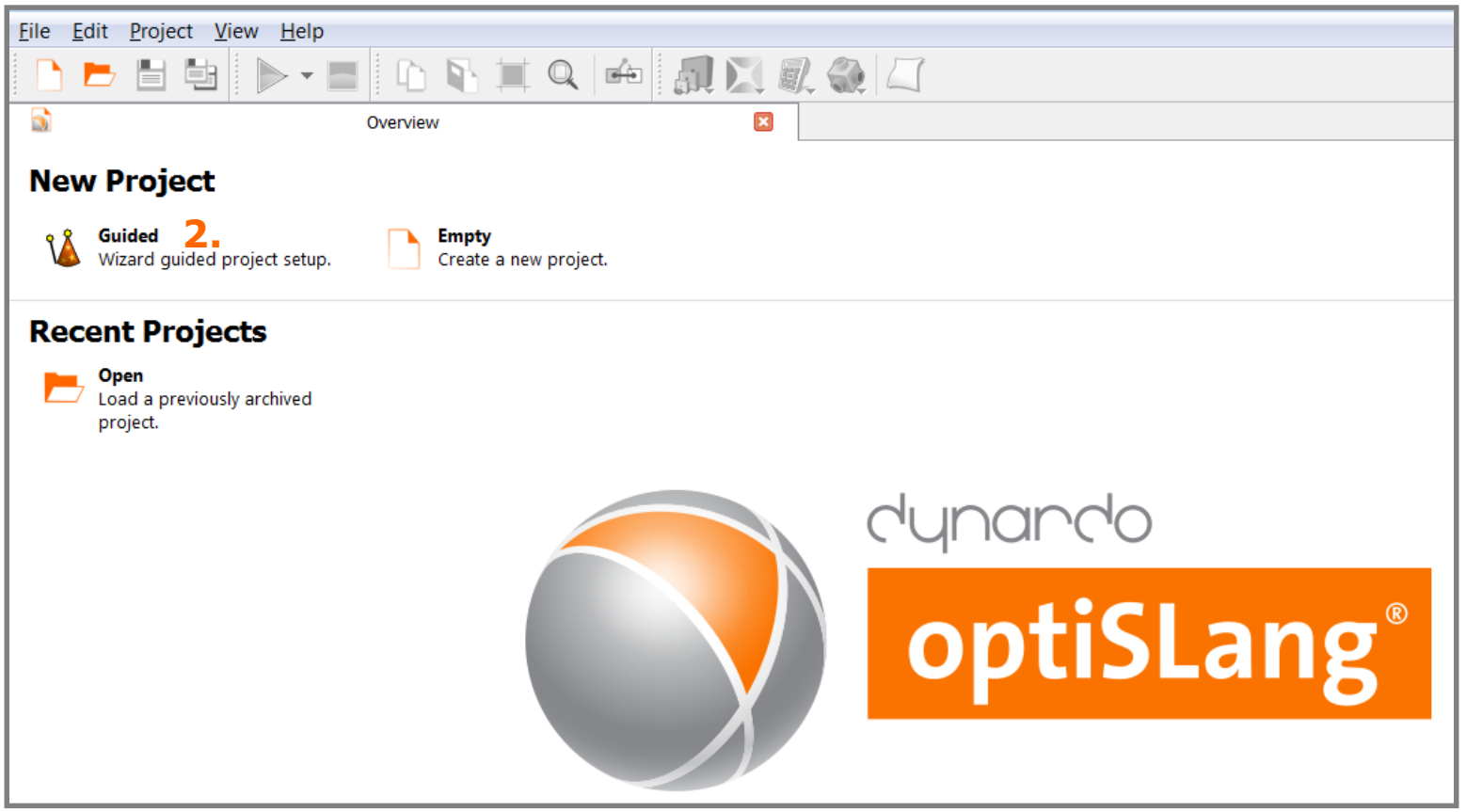
# Settings for more convenience

1. In Settings: choose treeview for more convenience during input parametrization
2. Close optiSLang



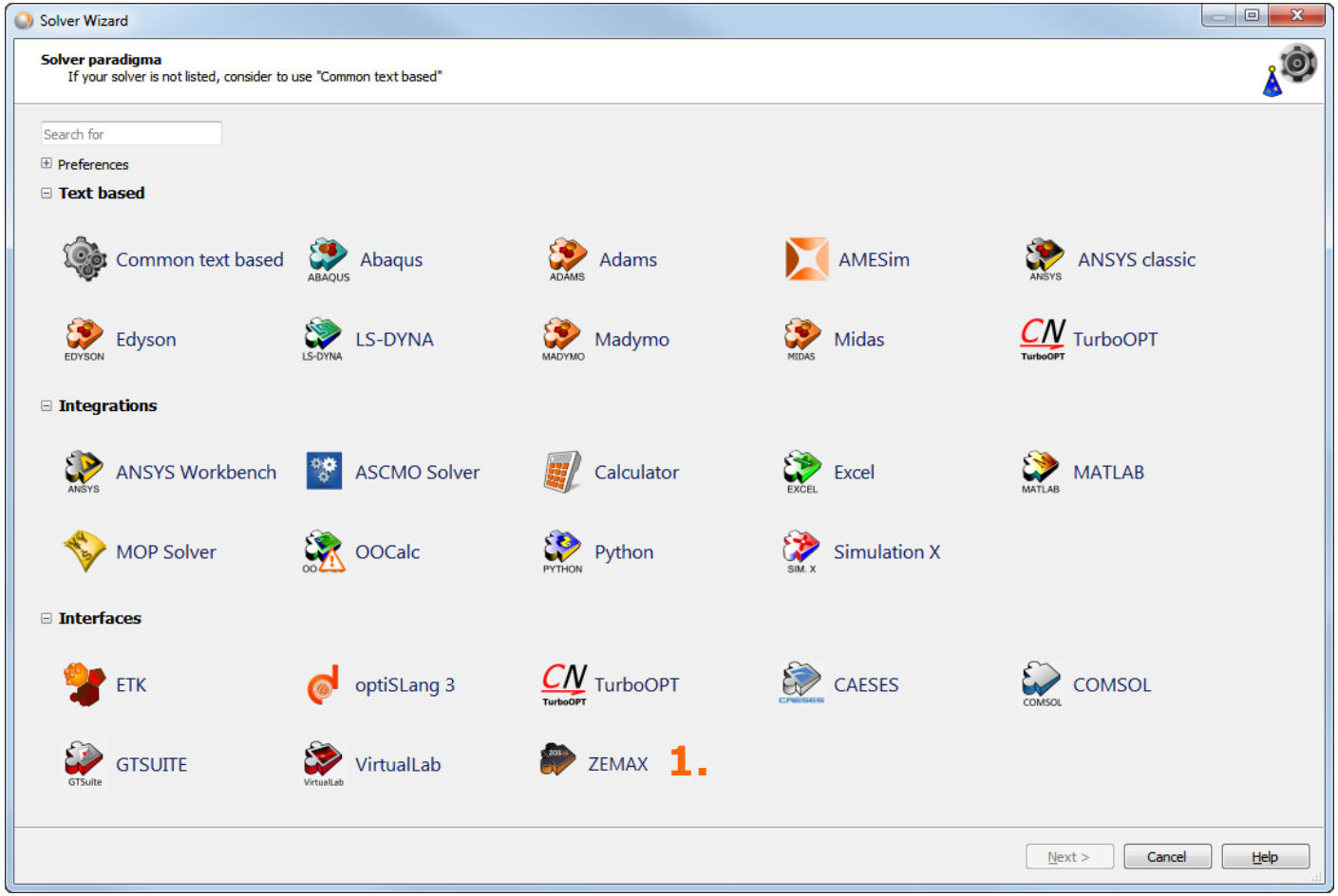
# New Project

1. Open optiSLang
2. Create New project with help of Guided project setup



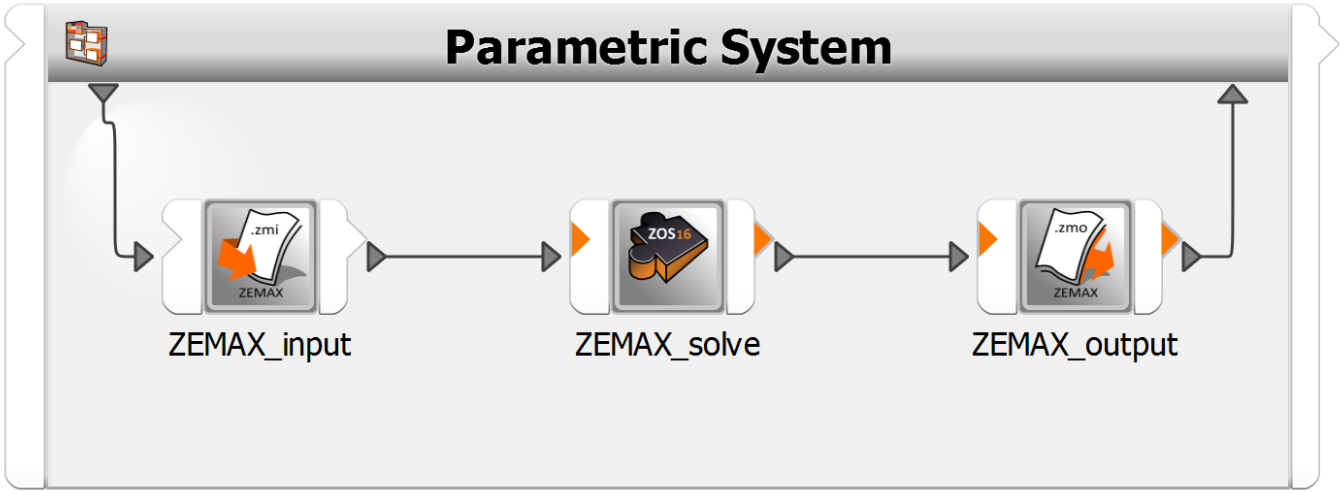
# Process Integration

1. Select “Zemax” as solver



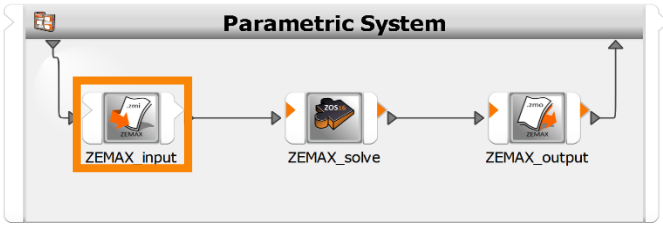
# Process Integration and Solver Chain

- Choose the Zemax file
- The solver chain is automatically created

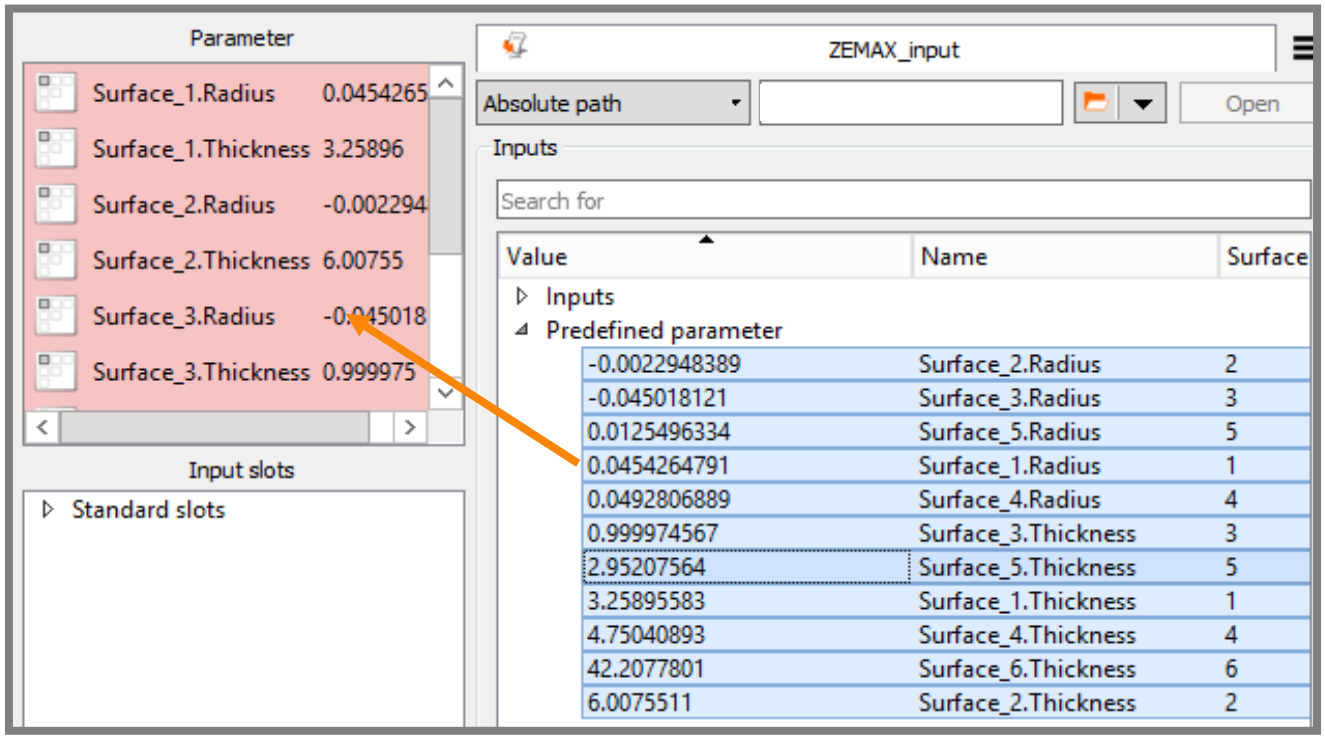


# Process Integration and Solver Chain

1. Double click on input node

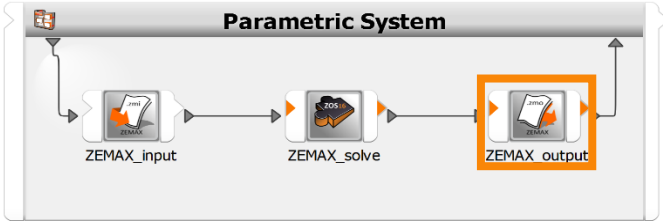



2. Mark all predefined input parameters, drag them to the parameter block and let them drop

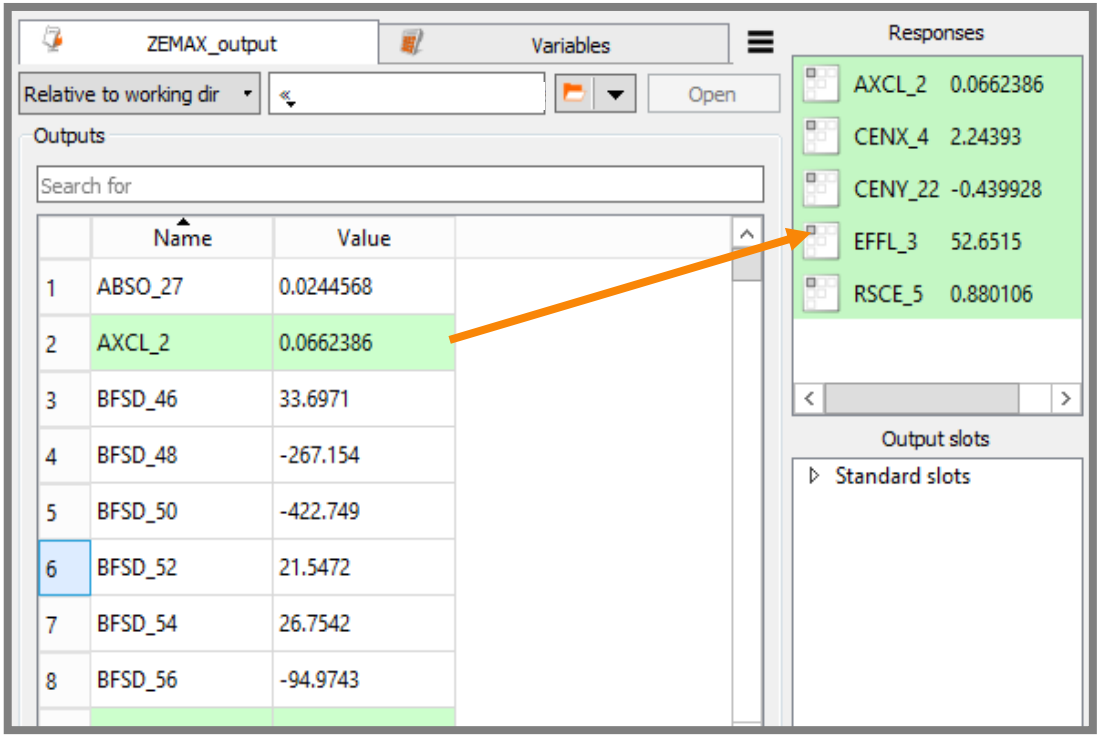


# Process Integration and Solver Chain

1. Double click on output node

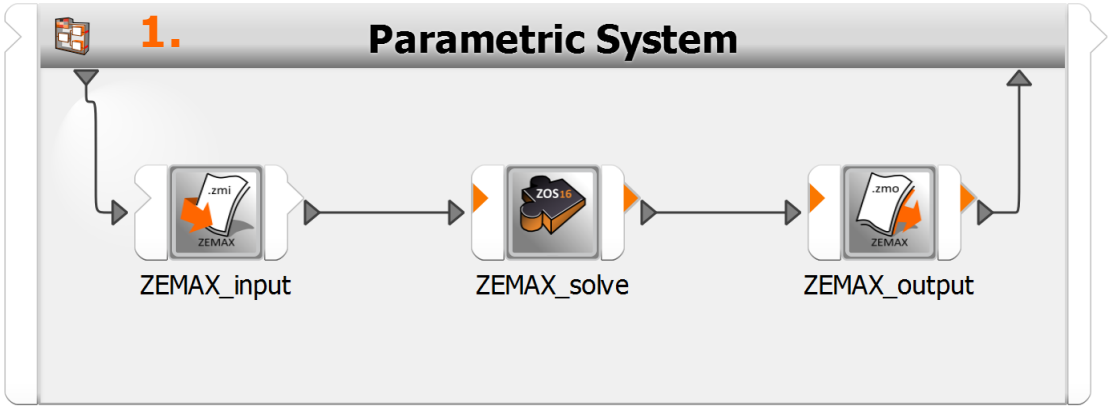



2. Mark all merits you want to consider,
   drag them to the responses block and let them drop



# Parameter Properties

1. Double click on the head of the solver chain
2. Adjust lower and upper bounds for all parameters




Parameter | Criteria | Other | Result designs

| | Name | Parameter type | Reference value | Constant | Value type | Resolution | Range | | Range plot |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2. | | |
| 1 | Surface_1.Radius | Optimization | 0.0454265 | ☐ | REAL | Continuo... | 0.0408838 | 0.0499691 | |
| 2 | Surface_1.Thickness | Optimization | 3.25896 | ☐ | REAL | Continuo... | 2.93306 | 3.58485 | |
| 3 | Surface_2.Radius | Optimization | -0.00229484 | ☐ | REAL | Continuo... | -0.00252432 | -0.00206536 | |

# Following steps

- Now the workflow is ready to be used
- Next possible steps are
  - Sensitivity analysis
  - Optimization
  - Robustness analysis
- Next steps for a sensitivity analysis are described in the tutorial 01_coupled_function_sensitivity.pdf that can be found in C:\Users\Public\Documents\Dynardo\ANSYS optiSLang\6.0.0\tutorials\02_analytical_function starting from page 17

If you have any questions belonging this example do not hesitate to contact

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