

OpticStudio®

17.5 Release Notes

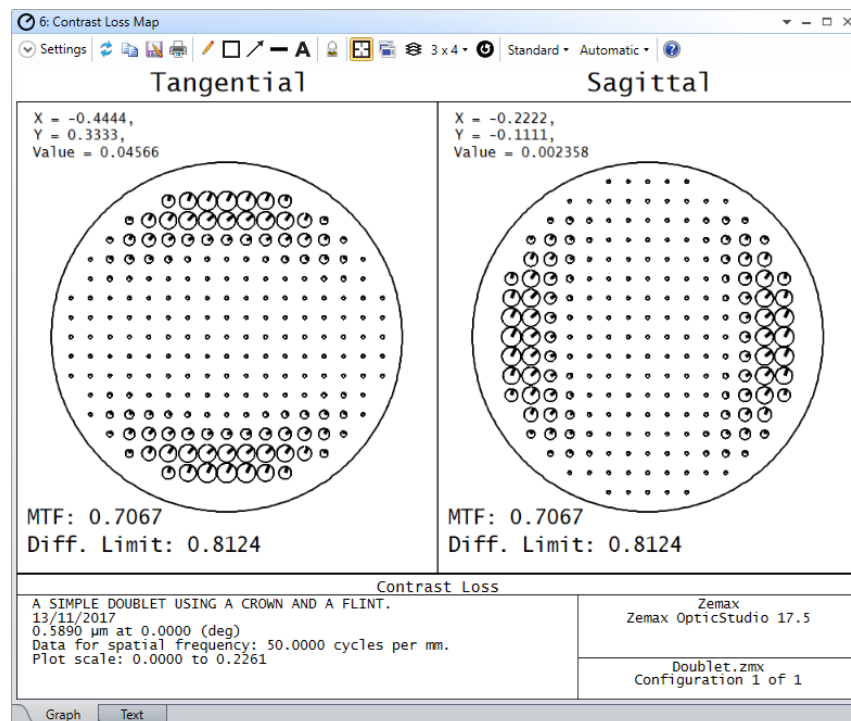
November 16th, 2017

1 SEQUENTIAL FEATURES

1.1 CONTRAST LOSS MAP ANALYSIS (PROFESSIONAL AND PREMIUM)

Visualize how the MTF is degrading across the pupil.

Gain insight into how the MTF is degrading across the pupil, and then use this data to determine what changes to make to your system to improve MTF.



The new Contrast Loss Map plots the same contrast loss values that are calculated during Contrast Optimization, which was introduced in OpticStudio 17. The Contrast merit function has a minimum in the same location as the MTF merit function. In addition, the Contrast merit function optimizes faster and more smoothly compared to direct MTF optimization.

The distribution pattern in the Contrast Loss Map indicates regions of the pupil that contribute to poor MTF. For each sample point in the pupil, a circle and clock hand are drawn to indicate the amount of the contrast loss and wavefront error, respectively.

The Contrast Loss Map can be found in the Analyze tab under MTF > Contrast Loss Map.

1.2 ADDED FIELD DATA EDITOR FUNCTIONALITY (ALL EDITIONS)

Manage large sets of fields points more easily when designing wide angle systems.

| Comment | X Angle (°) | Y Angle (°) | Weight | VDX | VDY | VCX | VCY | TAN |
|---------|-------------|-------------|---------|---------|----------|----------|---------|---------|
| 1 | 0.00000 | 0.00000 | 1.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 2 | 0.00000 | 10.00000 | 0.50000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 3 | 0.00000 | 14.00000 | 0.50000 | P | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 4 | 0.00000 | 33.00000 | 0.50000 | P | 0.00000 | -0.24049 | 0.01767 | 0.24052 |
| 5 | 0.00000 | 35.00000 | 1.00000 | 0.00000 | -0.76655 | 0.33799 | 0.76663 | 0.00000 |

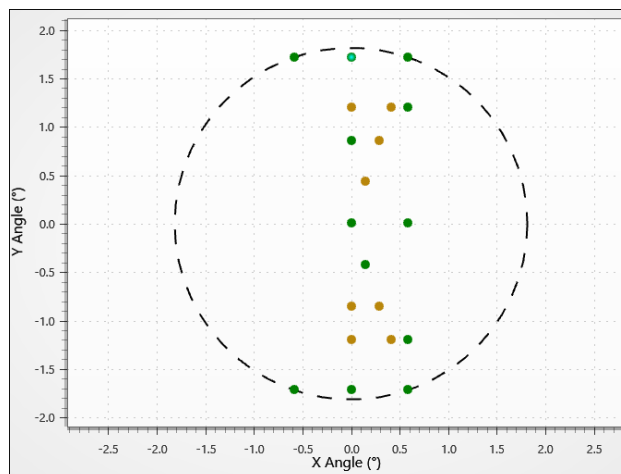
The flexibility added to the Field Data Editor makes it easier to set up a system. Several additions have been made to the Field Data Editor:

- Turn field points on and off quickly - Use the new Ignored setting to include or exclude specific field points in your system.
- Apply calculations from previous vignetting factors - Pickup solves were added to the weight column and the vignetting factor columns so that values from previous field points can be used.
- Switch easily between configurations - Use multi-configuration arrows at the top of the editor to change the active configuration.

1.3 FIELD PLOT (ALL EDITIONS)

Ensure the field of view is being accurately sampled when you design freeform systems.

A new Field Plot shows a scatter plot of all the defined field points for the current configuration. Using this new feature, you can visualize the distribution of field points without needing to check layout plots.

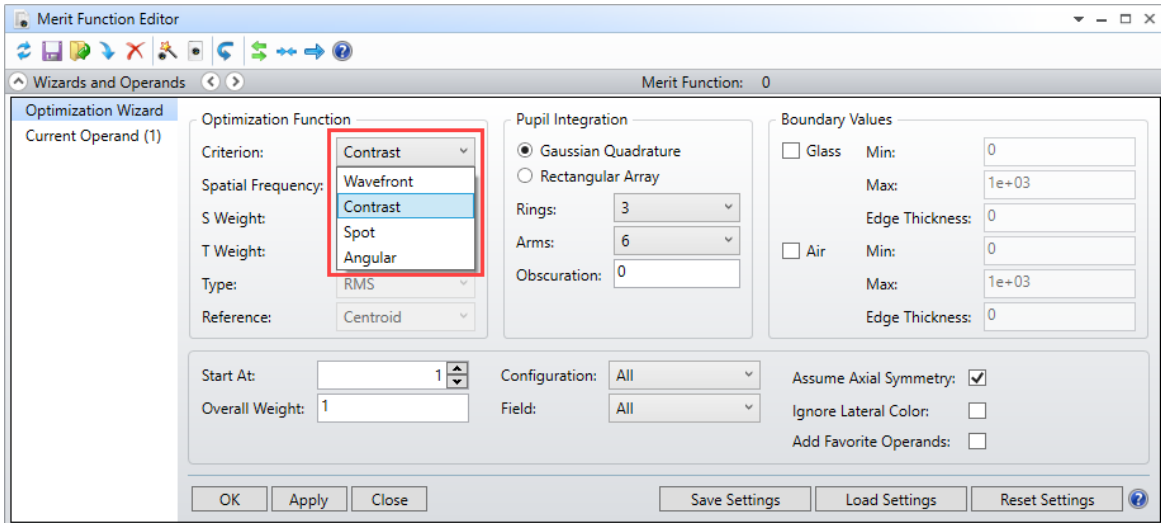


The Field Plot is on the right side of the Field Data Editor. You can hide the Field Plot using the arrow button.

1.4 SIMPLIFIED OPTIMIZATION WIZARD (ALL EDITIONS)

Build your merit function right the first time.

It's now easier to choose the right optimization method and find the right settings in the Optimization Wizard.



The user interface of the Optimization Wizard has been simplified. Four optimization function criteria are now available in the default merit function:

- Wavefront - Measures the aberration in waves
- Contrast - Optimizes the MTF using Contrast Optimization introduced in OpticStudio 17
- Spot - Computes both the x and y extent of the transverse ray aberrations in image space
- Angular - Computes both the x and y extent of the angular aberrations in image space

The Spot and Angular criteria consider the x and y components separately. These two criteria are optimized together. The signs of aberrations are retained, which yields better derivatives for optimization.

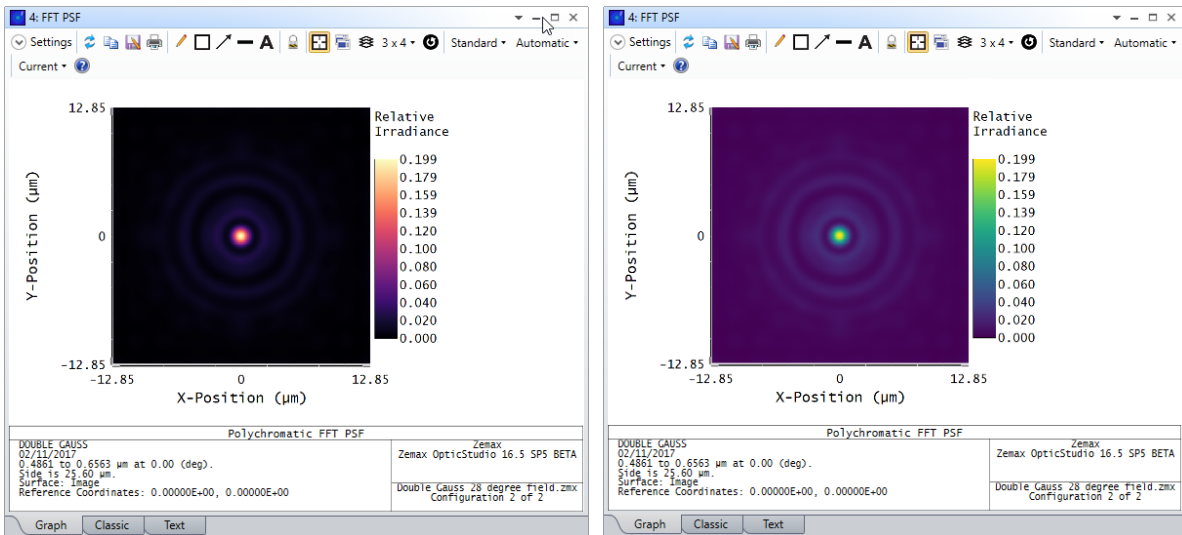
2 USABILITY

2.1 FALSE COLOR PALETTES (ALL EDITIONS)

Choose the color palette that suits your data and correctly highlights regions of interests.

This setting in Project Preferences selects the color spectrum for all analysis windows with a False Color display. For most forms of color blindness, the new color palettes are easily differentiated.

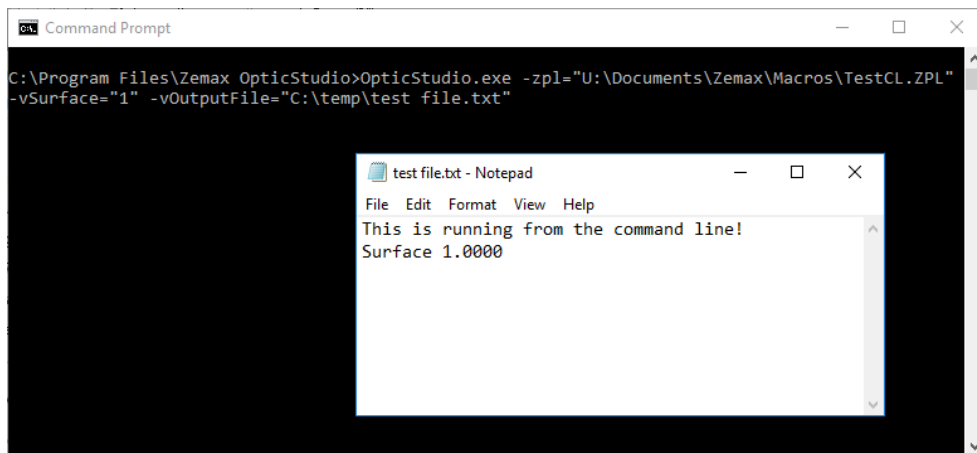
You can find this setting in Project Preferences > Graphics. Spectrum is the default and is based on the Jet colormap, which, although widely used, has drawbacks. Viridis and Magma are preferred for printing in grayscale and for people with color blindness.



3 PROGRAMMING

3.1 RUN ZPL MACROS FROM THE COMMAND LINE (PROFESSIONAL AND PREMIUM)

Run automated and customized OpticStudio calculations using a command line interface.



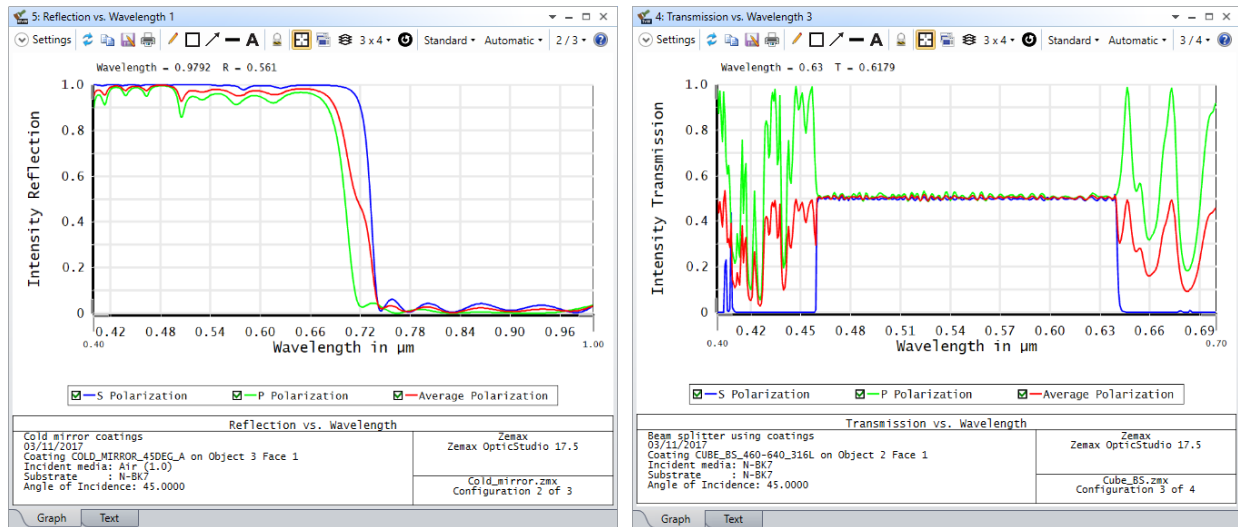
You can now run ZPL macros quickly outside of the OpticStudio user interface by passing special flags using the Windows command line.

4 LIBRARIES

4.1 ESSENTIAL MACLEOD COATINGS (ALL EDITIONS)

Use catalog data from Essential Macleod in coatings so your simulation matches reality.

Use real thin film coatings rather than approximations or ideal definitions. These new coatings by Essential Macleod have been added to the default coating file, COATING.DAT. Their applications include anti-reflection, cold mirrors, beamsplitters, protected and enhanced reflectivity, and near-infrared.

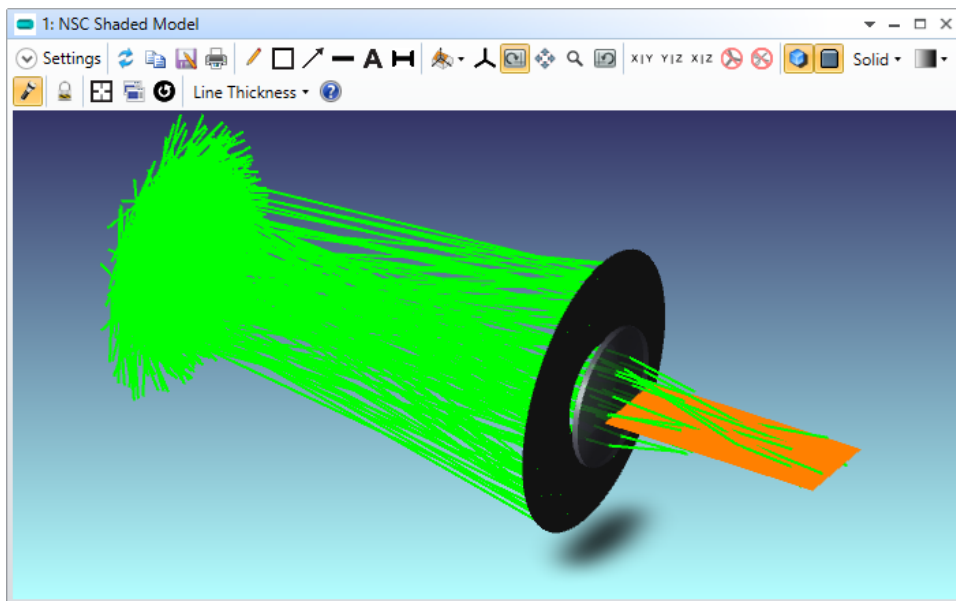


For more information, read the Knowledgebase article:

<http://customers.zemax.com/os/resources/learn/knowledgebase/macleod-coatings-typical-examples>

4.2 NEW SAMPLE FILES FROM PERSPECTIVES ON MODERN OPTICS AND IMAGING (ALL EDITIONS)

Get started quickly using new optical designs.



Sample files from *Perspectives on Modern Optics and Imaging*, a new book by Ronian Siew, have been added to the installer. Choose one of 14 new sample files to study modern optical systems and use them as a starting point for your design.

The sample files are in Samples\Design Applications\Perspectives on Modern Optics and Imaging by Ronian Siew.

4.3 CATALOG UPDATES (ALL EDITIONS)

Get the latest catalog updates from CDGM, UMICORE, Edmund Optics, and Ushio Opto Semiconductors.

Material Catalogs:

- The CDGM Materials Catalog has been updated to include now more than over 20 new materials. Other materials have also been updated with auxiliary data such as relative cost or melt frequency.
- The UMICORE Materials Catalog has been updated to include the material GASIR 5.

Stock Lens Catalogs:

- The Edmund Optics Lens Catalog has been updated and now includes a line of aspherized achromats.

Radiant Source Model Catalogs:

- Epitex have been renamed to Ushio Opto Semiconductors and have added two more sources to their Radiant Source Model catalog: EDC850DS-1100-S5; 850 nm (Epitex Series) and SMBB850DS-1100-03; 850 nm (Epitex Series).

Test Plate Lists:

- The following Test Plate Lists are obsolete and have been removed from the installer: bmoptik.tpd and Cosmo.tpd.

IS Scatter Catalog:

- The Edmund Optics NT43-043 opal glass diffuser is now obsolete because Schott discontinued their Opal line.

5 BUG FIXES

OpticStudio 17.5 includes the following improvements and fixes:

Sequential

- **Global surface coordinates** - In sequential systems with multiple coordinate breaks and non-powered surfaces, global surface coordinates are now calculated correctly.
- **IMSF operand** - Merit functions with multiple IMSF operands in the Merit Function Editor are now calculated correctly.
- **CAD export** - Mirrors with a hole are now handled accurately when exporting them to a CAD file.
- **Q-Type Asphere surfaces** - The normalization radius for Q-Type Asphere surfaces is now correctly modified after the Fold Mirror tool is used.
- **ISO Element Drawing** - An issue with using one-sided tolerances in the ISO Element Drawing has been corrected.
- **Huygens MTF analysis** - An issue with calculating Huygens MTF in afocal mode has been corrected.
- **Wavefront Map analysis** - The calculation of RMS wavefront error below the Wavefront Map has been updated to use the same algorithm as reported in the RMS vs. Field Analysis for cases in which Tilt has not been removed from the wavefront.

- **FFT and Huygens PSF analyses** - Surface plots for the FFT and Huygens PSF now scale from 0 to 1 (rather than to the maximum PSF amplitude) when the Normalize check box is cleared.
- **Huygens PSF analysis** - When there is only one system wavelength, the Huygens PSF is now correctly calculated when All is selected for the wavelength input.

Non-sequential

- **Torus gradient index DLL** - A geometry error has been corrected when the Torus gradient index DLL is used.
- **Array Ring objects** - Improvements have been made when rays are traced through some Array Ring objects.
- **Source File objects** - When the Wavelength Shift option is used, Source File objects now correctly model fluorescence.
- **Bulk scattering** - Wavelength shift now correctly accounts for the expected Stokes shift.

Programming

- **NSTR keyword** - An issue with the ZPL keyword NSTR that resulted in no rays being traced during execution of the keyword has been corrected.
- **OPTIMIZE keyword** - An issue with the ZPL keyword OPTIMIZE that resulted in an invalid error message during execution of the keyword has been corrected.
- **GetOperandValue command** - An issue in which the return values from the ZOS-API command GetOperandValue were always zero has been corrected.
- **SetSolve data item** - An issue in which the return values from the DDE data item SetSolve were always zero has been corrected.

6 KNOWN ISSUES

Note the following known issues:

- **Non-sequential Layout plots** - Due to an error in the graphics libraries, rays in the non-sequential Layout plots do not appear to hit the correct pixel on a detector when the user zooms out. Only when zooming in can the rays be seen hitting the correct pixel on the detector. This issue is under investigation and it only affects the layout but not the calculation.
- **Field Data Editor** - When selecting a cell or row in the Field Data Editor, the background highlight occasionally disappears. You can however still edit the cells and re-opening the editor fixes the issue.