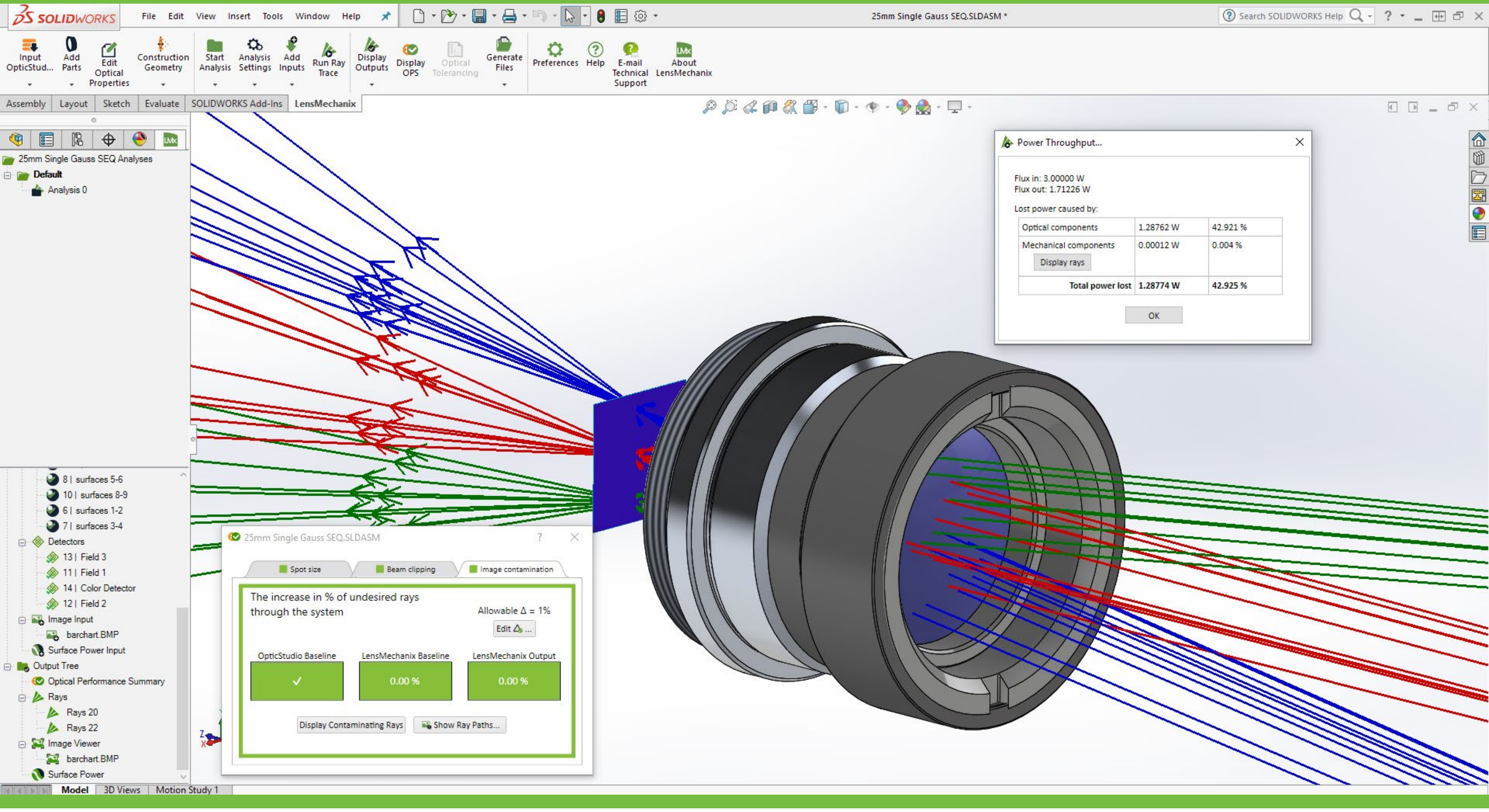
LensMechanix®
for SOLIDWORKS

4.5 release notes

March 21, 2018



If you have questions, contact
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1. Overview

New advanced features and capabilities enhance the functionality of LensMechanix

The LensMechanix® 4.5 release provides a robust feature set for mechanical engineers to package optical systems in CAD software. Design challenges, such as accommodating limited space requirements of mechanical envelopes, are now simple to overcome with the new Fold Mirror tool. Additional multi-configuration capabilities enable you to design multi-configuration optomechanical systems from sequential OpticStudio® files. Enhanced tolerancing capabilities help inform design decisions by providing tolerancing data from OpticStudio sequential design files in the graphics area.

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2. New features

2.1 Fold Mirror tool

Accommodate space requirements for predefined mechanical envelopes and adapt to mechanical envelope changes

Previously, if an optical assembly didn't fit within the predefined mechanical envelope, the best solution was to send the optical system back to the optical engineer to modify it. With the new Fold Mirror tool available in LensMechanix 4.5, you can now add fold mirrors directly in the CAD model to accommodate space requirements.

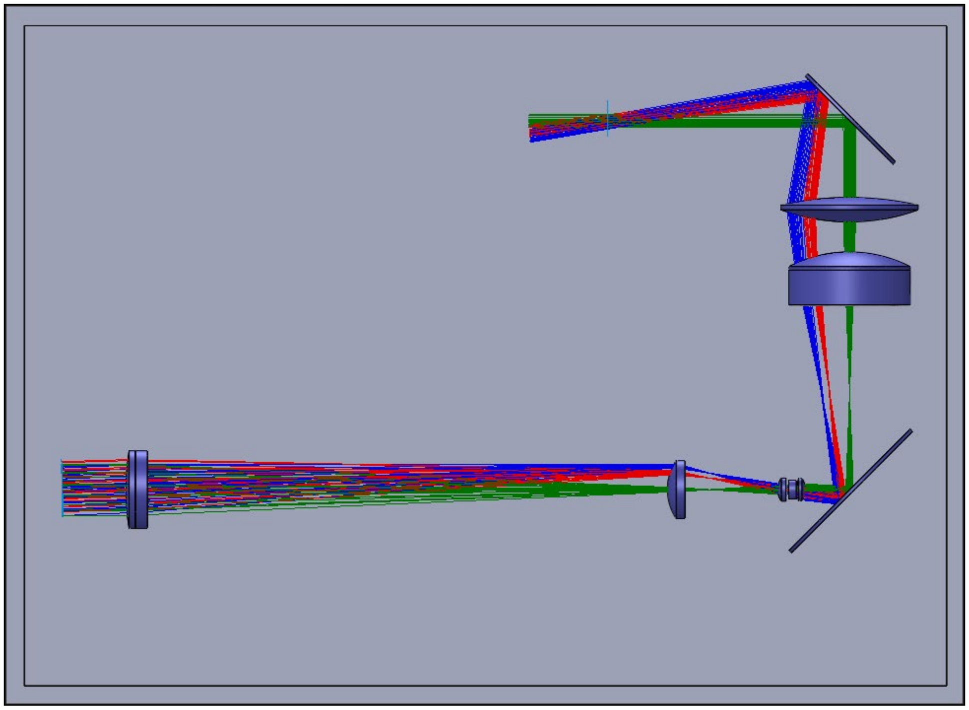

Figure 1: Fold mirrors added to an optical system

Solid geometry neutral power fold mirrors can be added at any position in the optical assembly. All down path components are automatically repositioned to maintain the optical axis path length. The fold mirrors are easily modified to fit the existing mechanical mounting conditions and structural requirements. To access this feature, click Add Parts in the Command Manager and select Add Fold Mirror.

After adding fold mirrors, you can analyze the complete optomechanical system in LensMechanix to verify compliance with optical requirements or provide the system to the optical engineer as a ZAR file for additional analysis and optimization in OpticStudio.

3. Enhancements

3.1 New mult-configuration capabilities

Design multi-configuration optomechanical systems from sequential OpticStudio files

LensMechanix 4.5 expands on the multi-configuration capabilities available in LensMechanix 4.0 by enabling you to design multi-configuration optomechanical systems from sequential OpticStudio files. This new functionality is useful for varying optical component locations, material types, scanning mirror positions, and aspheric coefficients.

The performance of all configurations is available at a glance using the Configuration Comparison Table that was introduced in LensMechanix 4.0. By showing spot size, beam clipping, and image contamination measurements for each configuration, the table helps you isolate issues and evaluate design options. To access this feature, click Display Outputs in the Command Manager and select Multi-configuration comparison.

+	Concentric	25 um shift	50 um shift

Figure 2. Collapsed Configuration Comparison Table

−	Concentric	100 um shift	200 um shift
Spot size	0.0655 µ	1.6585 µ	3.7465 µ
Beam clipping	0.00 %	7.57 %	92.77 %
Image contamination	0.00 %	0.00 %	0.00 %

Figure 3. Expanded Configuration Comparison Table

3.2 Advanced tolerancing capabilities

Overcome the critical design challenge of tolerancing mechanical assemblies and components to maintain optical performance during manufacturing with the ability to access tolerancing data from OpticStudio sequential design files

LensMechanix 4.5 displays optical component tolerancing information in the graphics area. This information is especially useful when you're designing mechanical components for lens systems that have tight tolerances where small changes in position can affect the system's performance.

LensMechanix displays two categories of optical tolerances:

- Positional tolerance information – Refers to possible changes in position that the optical engineer has accounted for during the tolerance analysis. Position changes are the result of variation in mechanical component tolerances or variations in the manufacturing process.
- Parameter tolerance information – Refers to changes in the optical component, such as the radius of curvature, thickness, or refractive index. These changes commonly stem from imperfections during the manufacturing process of the optical component.

When you load a file that contains tolerance information, the optical components with tolerance data display in green or yellow. To access tolerance data for any green or yellow optical component, click Optical Tolerancing in the Command Manager and then click the optical component of interest in the graphics area.

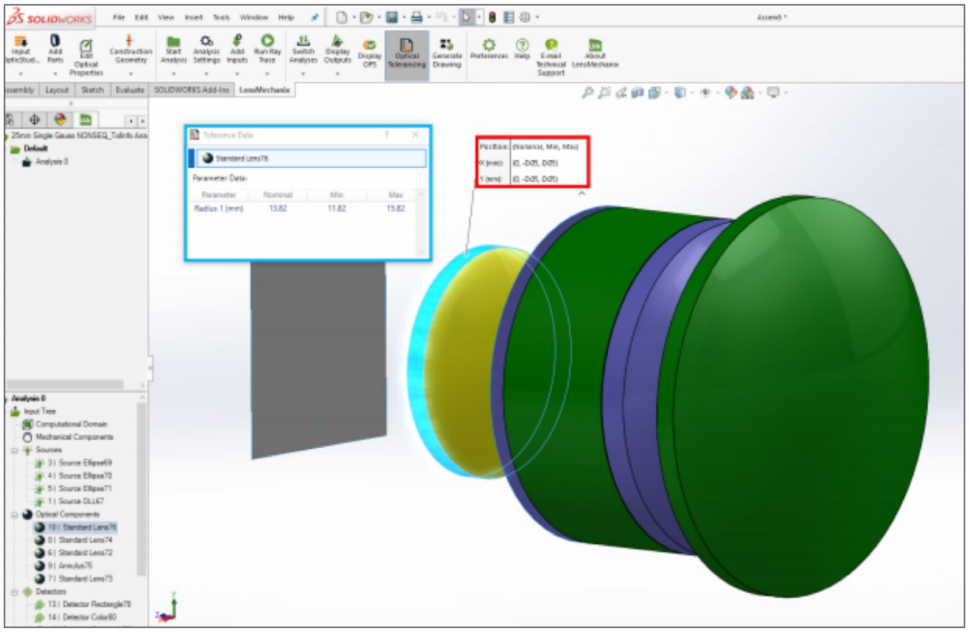

Figure 5. Positional and parameter tolerances shown in the graphics area

The following table summarizes the color schema of the optical tolerancing information.

Scenario	Description	Result
1	No components have tolerance information	All optical components = default color
2	One component has tolerance information	One component with tolerance information = green Other components = default color
3	Two components have the same tolerance information	Two components with same tolerance information = green Remaining components = default color
4	Two components have different tolerance information	Optical component with the tightest tolerance = yellow Other component = green Remaining components = default color
5	Six components consist of three pairs. Each pair has a different level of tolerance: • Two objects with high tolerance • Two objects with nominal tolerance • Two objects with no tolerance information	Two components with high tolerance = yellow Two components with nominal tolerance = green Two components with no tolerance information = default color

About Zemax

Zemax's industry-leading optomechanical product design software, OpticStudio and LensMechanix, helps optical and mechanical engineering teams turn their ideas into reality. Standardizing on Zemax software reduces design iterations and repeated prototypes, speeding time to market, and reducing development costs.

We touch nearly every optical system manufactured today, including virtual reality systems, cell phone cameras, autonomous-vehicle sensor systems, and intraocular lenses—even imaging systems for the Mars Rover. By listening to our customers, we deliver unmatched value and have the largest, most passionate user base in the industry.

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