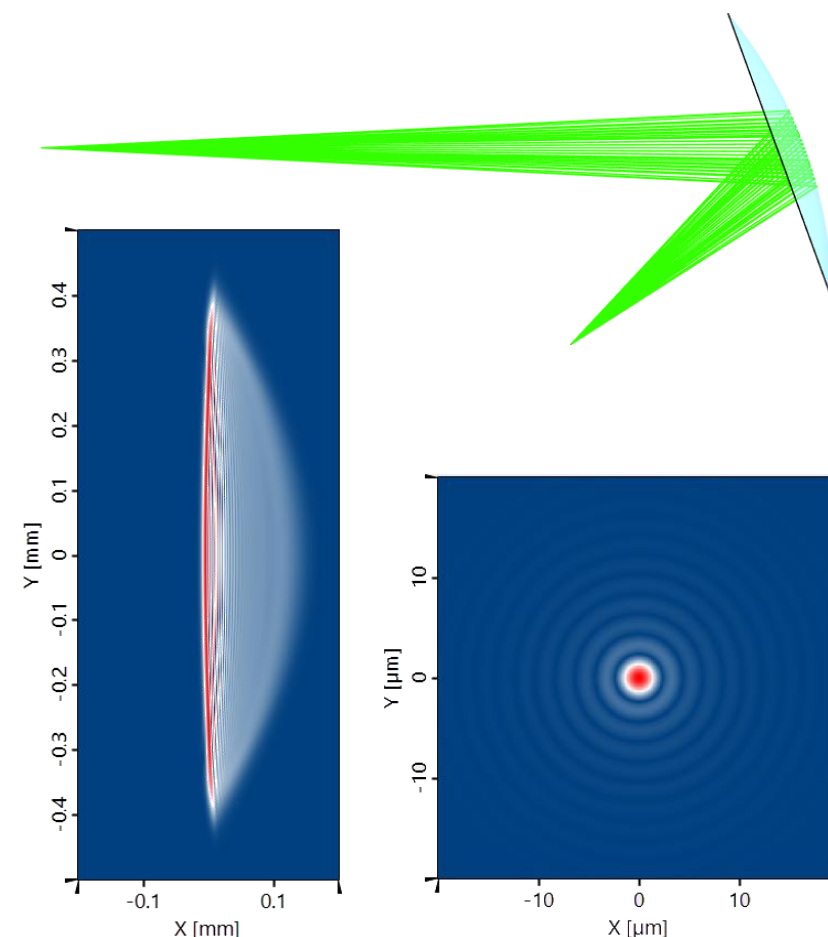


Off-Axis Focus Correction for a Reflective Conical Surface

via Wavefront Phase Modifier (WPM) Twin

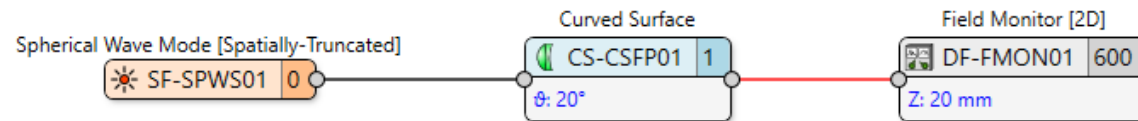
Doc. ID:	FD-WPM-REFL
Doc. Version:	1.2
Date:	August, 20, 2026
Author	LightTrans International GmbH
SW Package:	VirtualLab Fusion Platform
SW Version:	2026.2 (Build 3.30)



Scenario

Demo System

A spherical wave with a 5mm diameter should be focused by a 20° tilted conical mirror at a 20mm distance.

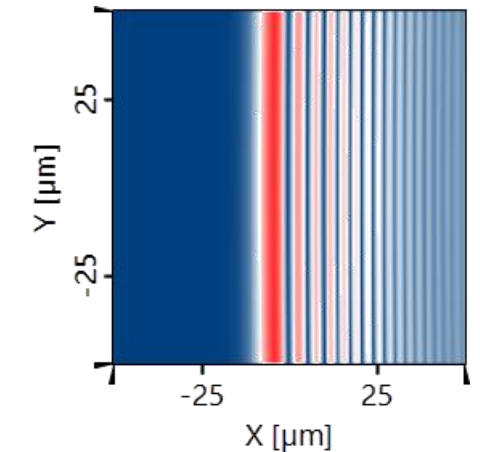
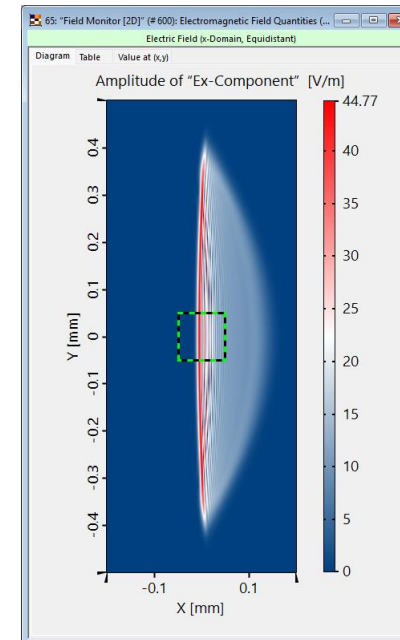
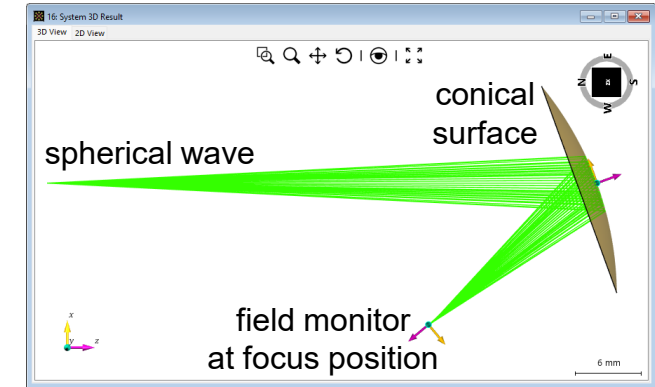


Problem to Be Addressed?

The focus of such a conical mirror is strongly distorted due to wavefront phase aberrations.

Desired Correction for Ideal Focus Spot

We suggest using one of our WPM twins:
the *Wavefront Phase Modifier [Surface, Output Defined]*



Aberrated focus spot (left)
with zoomed in center detail (right)

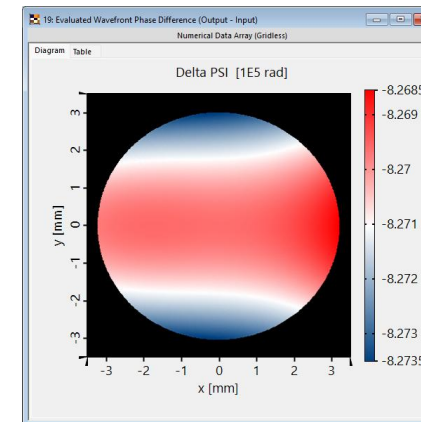
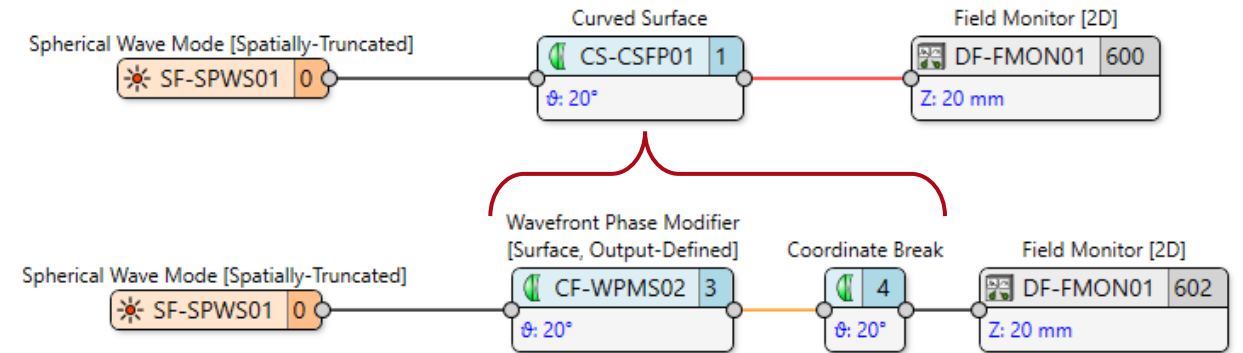
Wavefront Phase Correction

Correcting the Focus of a Reflective Conical Surface via WPM

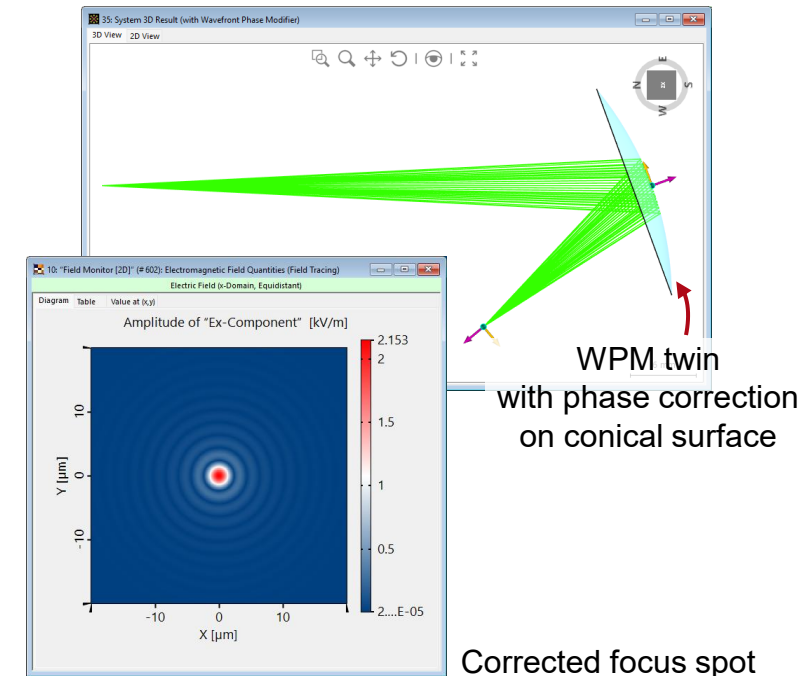
- The *Wavefront Phase Modifier [Surface, Output-Defined]* can be used to identify and apply the required correction.
- An ideal spherical wavefront phase converging to 20mm defines the desired output.
- As the suffix *[Surface, Output-Defined]* suggests, the WPM derives and applies the required phase modification

$$\Delta\psi = \psi_{\text{desired out}} - \psi_{\text{in}}$$

directly on the curved surface.



Added correction of the wavefront phase profile ($\Delta\psi$)



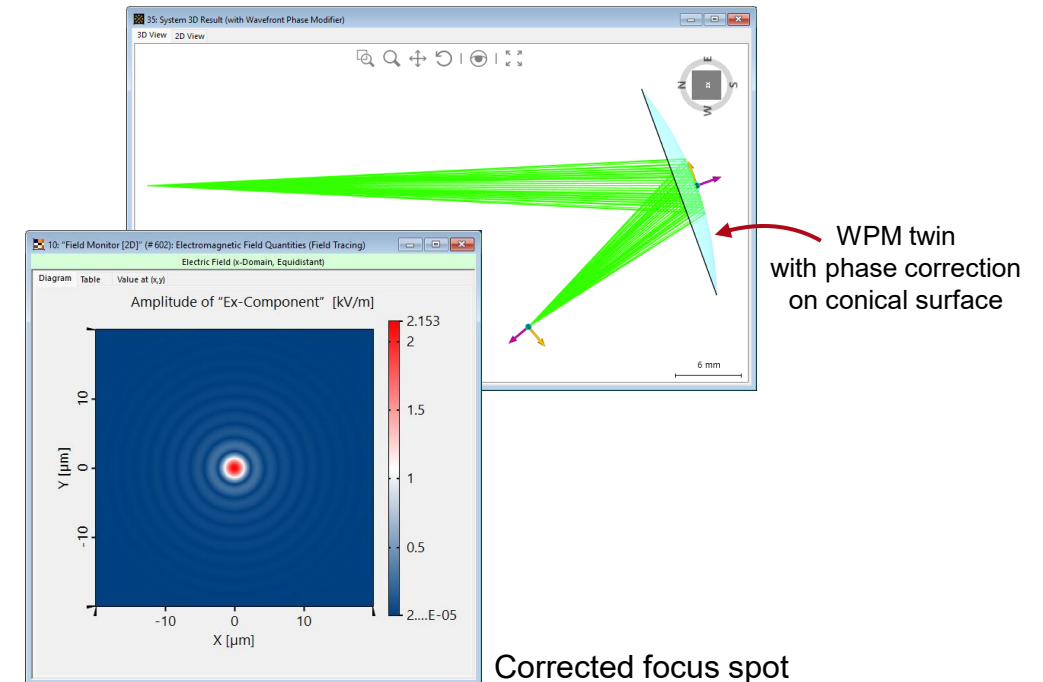
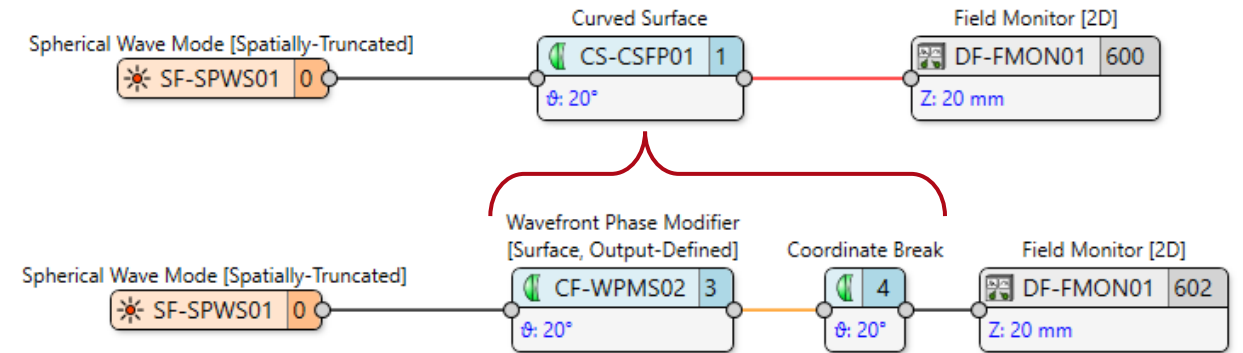
Wavefront Phase Correction

Correcting the Focus of a Reflective Conical Surface via WPM

- The *Wavefront Phase Modifier [Surface, Output-Defined]* can be used to identify and apply the required correction.
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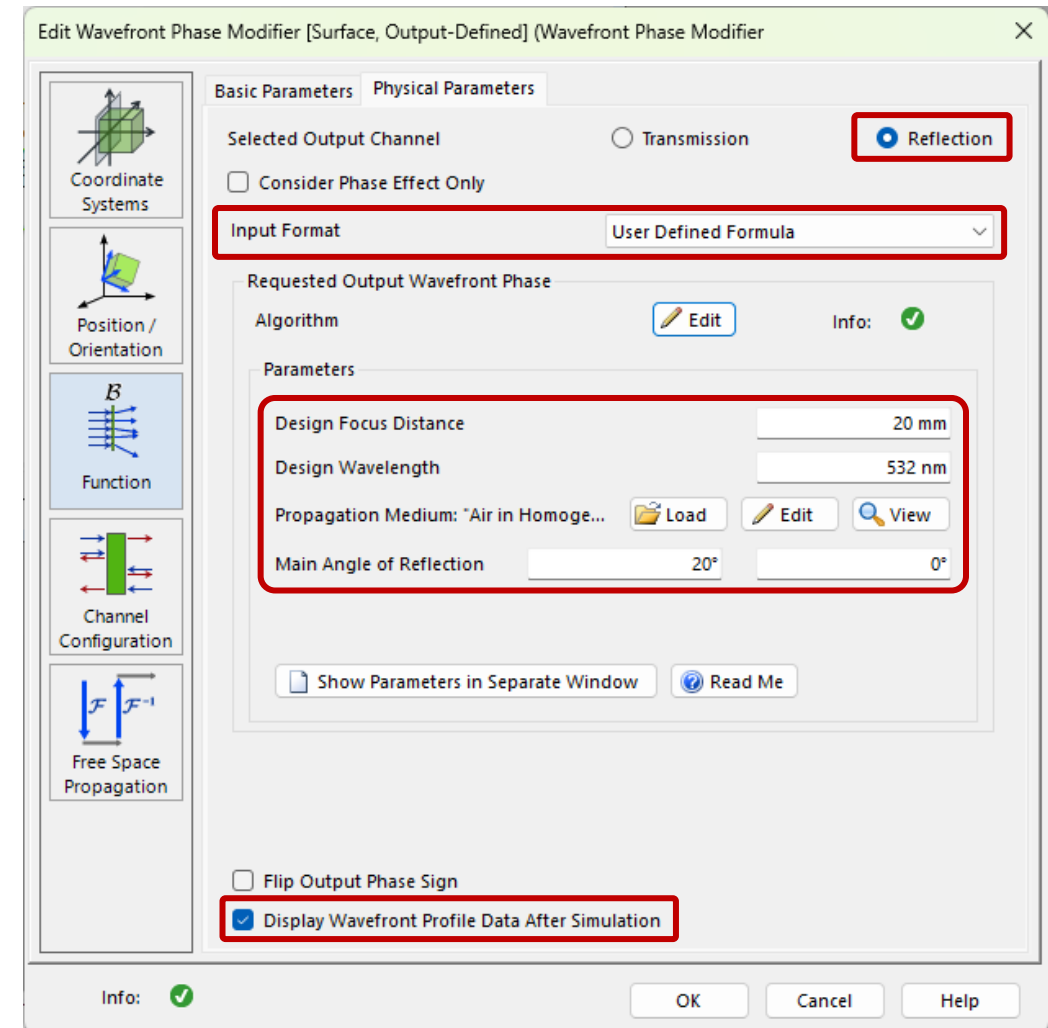
directly on the curved surface.



Workflow

What the User Does

1. Open and run the Optical Setup without the Wavefront Phase Modifier twin.
2. Inspect the focal spot without the modifier at a distance of 20mm from the conical surface.
3. Open the system containing the Wavefront Phase Modifier twin [Surface, Output-Defined].
4. The input format of the Wavefront Phase Modifier is set to "User Defined Formula" with a pre-configured snippet.
5. The snippet exposes certain configurable values to define the required output wavefront phase. In this case, default values are pre-configured.
6. Run the simulation and inspect the corrected focal spot and extracted $\Delta\psi$.



Related Resources

Use Cases and Feature Demos

- [FD-HOE-TRANSFER: Transfer Wavefront Phase Profile to HOE Twin for a Structure-based Off-Axis Focusing](#)
- [Wavefront Error Detector](#)
- [Aberration Control via Metalens](#)
- [Wavefront Phase Modifier Twins \(Collimation\)](#)
- [Transfer Wavefront Phase Profile to a Metalens](#)

Tutorials

- [Wavefront Phase Modifiers](#)