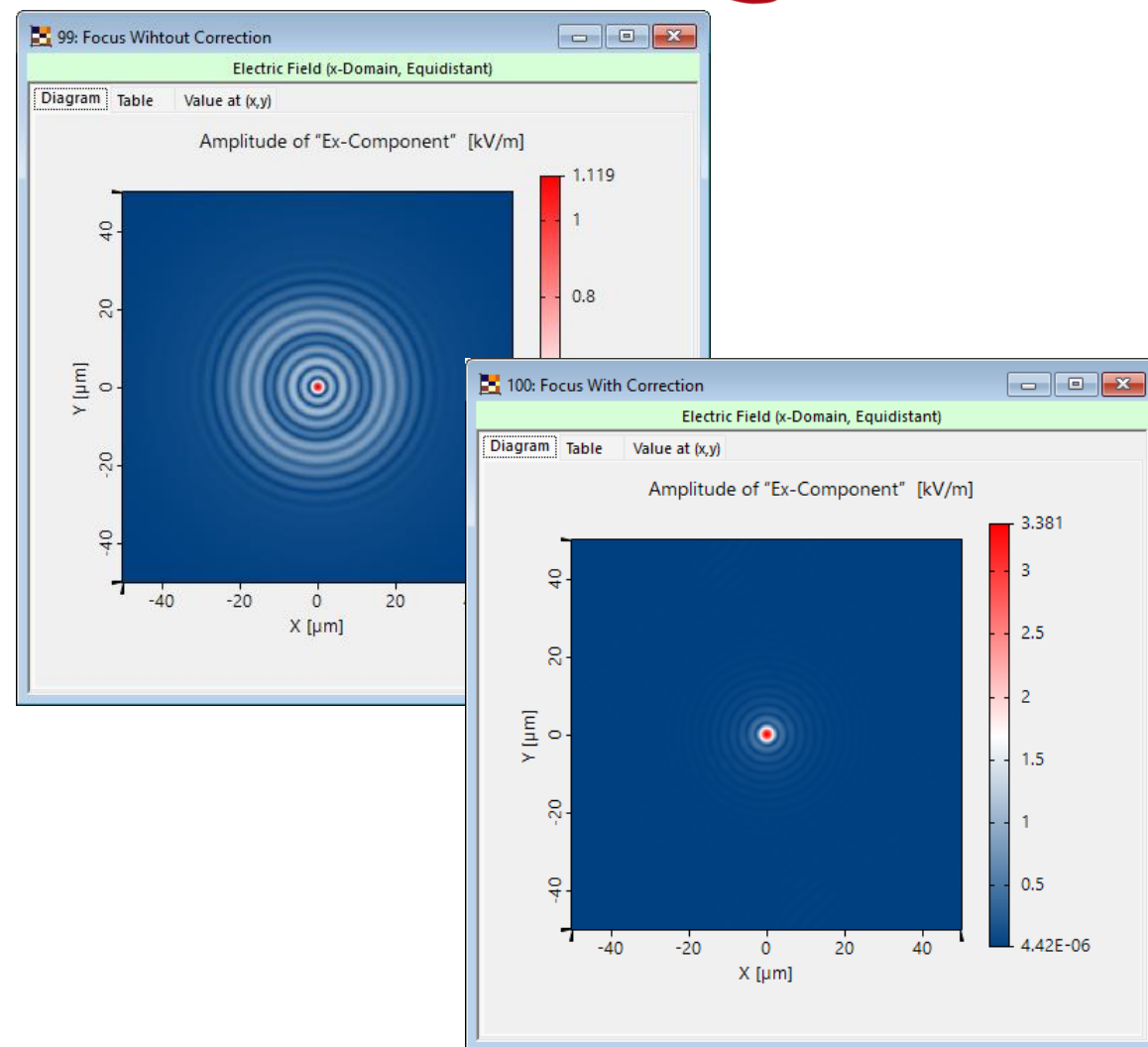


Wavefront Phase Modifier Twins

Wavefront Phase Correction On a Convex Lens Surface

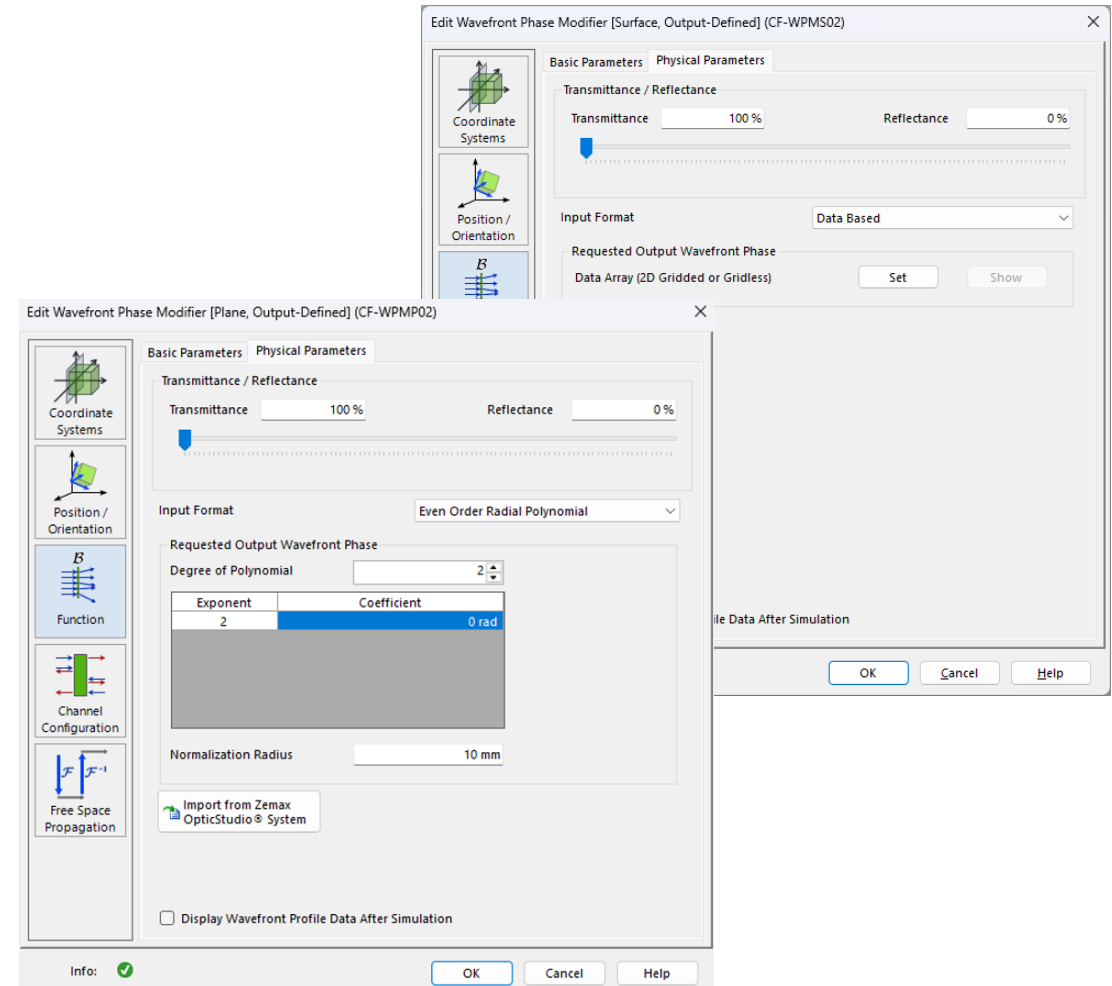
Document ID:	FD-WPM-COR
Version:	1.1
Date:	July 28, 2026
Author:	LightTrans International GmbH
Version:	2026.2
Package:	Platform



What Can Wavefront Phase Modifiers Be Used For?

Wavefront Phase Modifier Twins

- **CF-WPMP01: Wavefront Phase Modifier [Plane, Profile-Defined]** — Applies a prescribed phase profile on a plane.
- **CF-WPMP02: Wavefront Phase Modifier [Plane, Output-Defined]** — Derives and applies the required phase modification on a plane from the desired outgoing wavefront.
- **CF-WPMS01: Wavefront Phase Modifier [Surface, Profile-Defined]** — Applies a prescribed phase profile on a surface.
- **CF-WPMS02: Wavefront Phase Modifier [Surface, Output-Defined]** — Derives and applies the required phase modification on a surface from the desired outgoing wavefront.



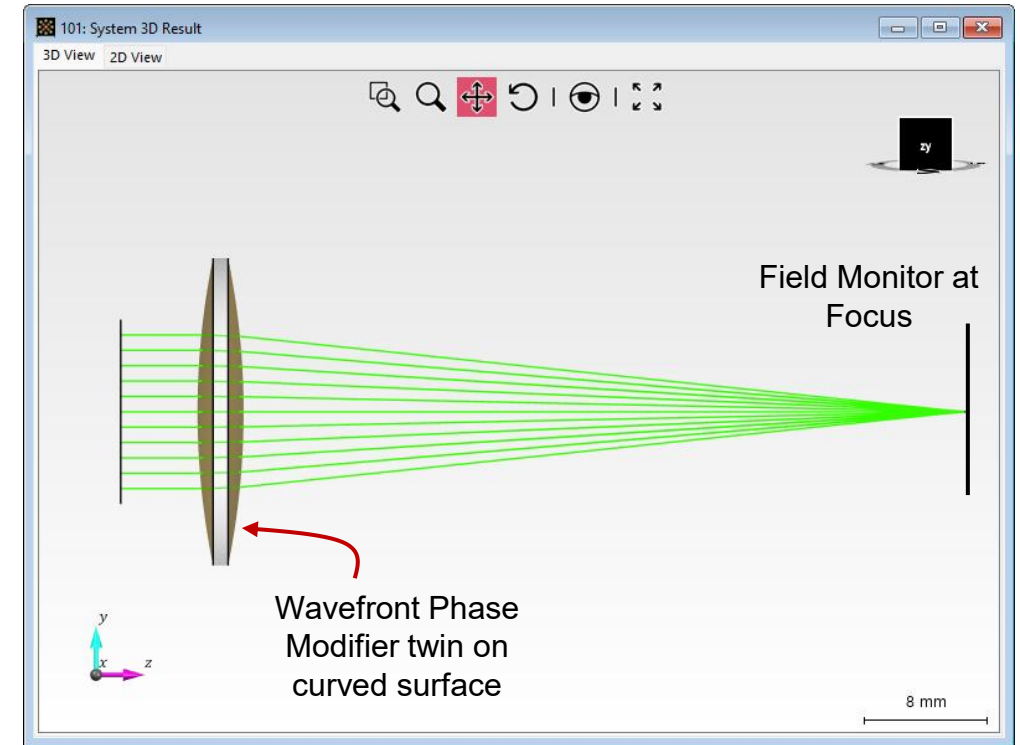
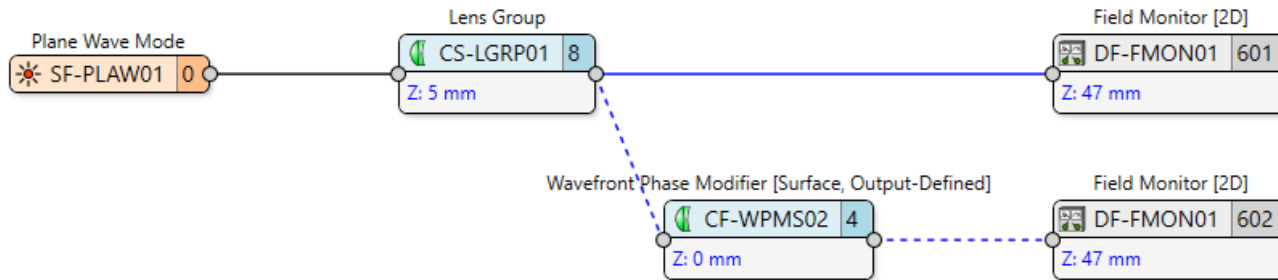
Configuring a Wavefront Phase Modifier Twin

* Find the specification sheets in the Documentation Ecosystem using the twin codes.

Demo: Wavefront Phase Modifier [Surface, Output-Defined]

💡 Correcting the Focus of a Fixed Lens

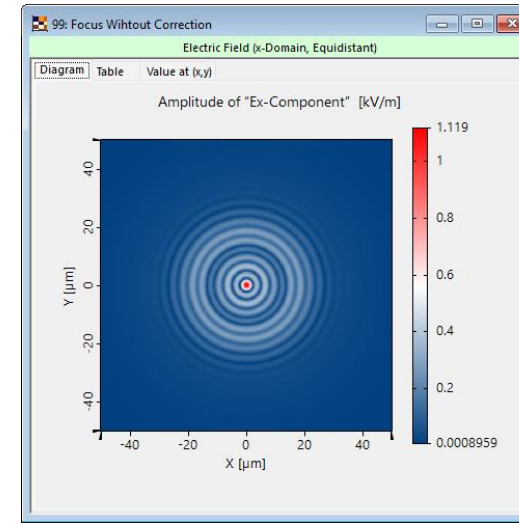
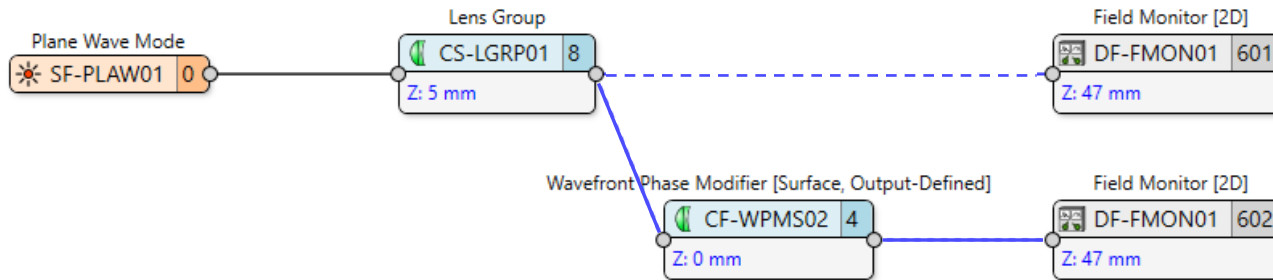
- A fixed biconvex N-BK7 lens forms an aberrated focal spot at about 47 mm without the modifier.
- An ideal converging spherical wavefront focused at 47 mm is used as the target output.
- The Wavefront Phase Modifier twin determines the required corrective phase $\Delta\psi$ on the curved lens surface.



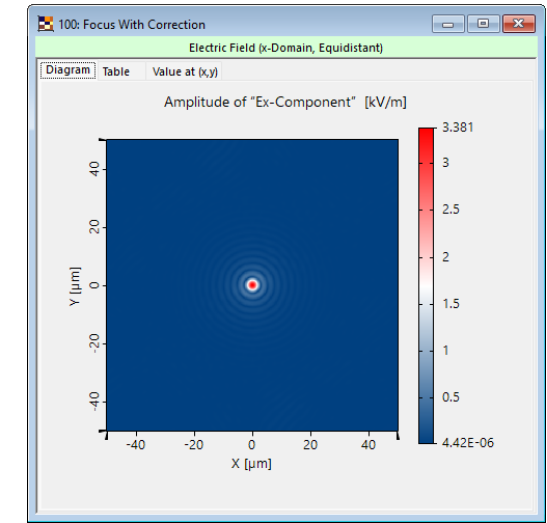
Results

💡 Main Observation

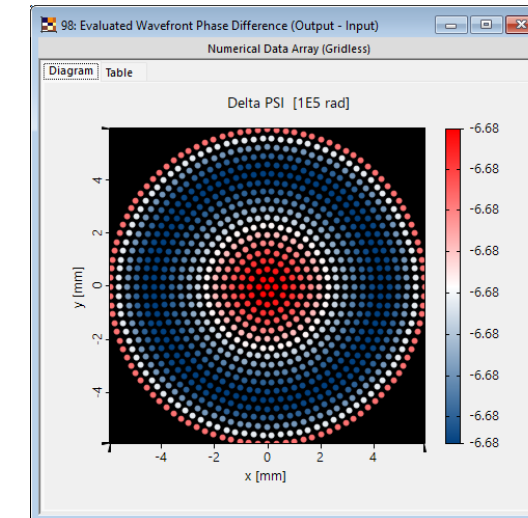
- Without the modifier, lens aberrations enlarge and deform the focal spot.
- With correction, the focal spot becomes smaller and Airy-like.
- The extracted $\Delta\psi$ describes the required phase correction. It can then be implemented as an HOE or metasurface on the curved surface.



Focal Spot Without Correction



Focal Spot With Correction

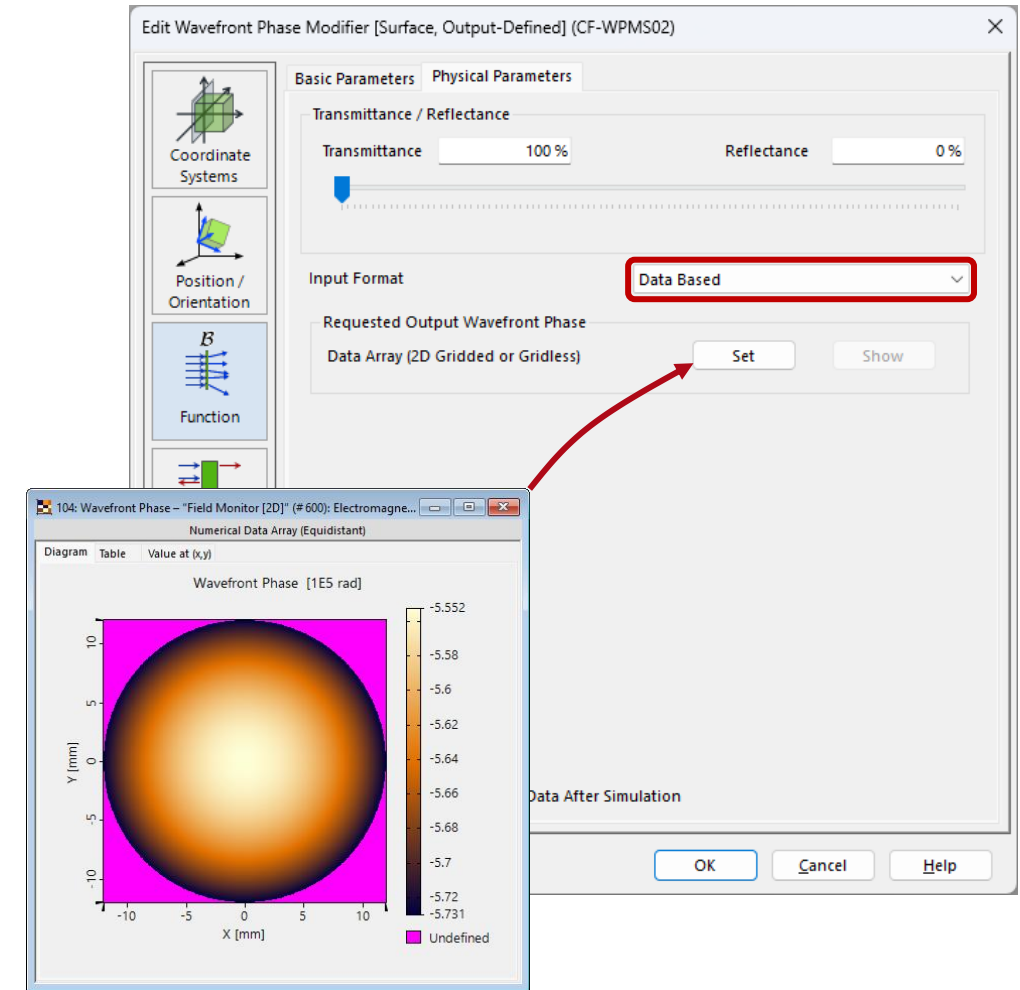


Required Corrective Wavefront Phase

Workflow

What the User Does

1. Open the lens system and run it without the wavefront phase modifier correction.
2. Inspect the focal spot without the modifier at 47 mm.
3. Open the system containing the Wavefront Phase Modifier twin [Surface, Output-Defined].
4. Select Data Based and load the ideal converging spherical wavefront phase data.
5. Run the simulation and inspect the corrected focal spot and extracted $\Delta\psi$.



Related Documents

¹₂₃ ≡ Use Cases and Feature Demos

- [Wavefront Error Detector](#)
- [Aberration Control via Metalens](#)
- [Wavefront Phase Modifier Twins \(Collimation\)](#)
- [Transfer Wavefront Phase Profile to a Metalens](#)

¹₂₃ ≡ Tutorials

- [Wavefront Phase Modifiers](#)

→ Suggested Next Steps

- Extend the correction to off-axis focusing.
- Use a helper system to generate the target wavefront phase for correcting an existing system.
- Define the target spherical wavefront phase directly using a formula snippet.