PHINDEN

PHASEFORM SENSORLESS ADAPTIVE OPTICS SOFTWARE

PHINDEN is Phaseform's turnkey software package that incorporates an intuitive graphical user interface for sensorless, image-based adaptive optics (AO) microscopy. PHINDEN automatically estimates aberrations and applies corrections via the Deformable Phase Plate (DPP) to enhance resolution, signal-to-noise ratio (SNR), and contrast. PHINDEN runs seamlessly in the background alongside native microscope control software, allowing you to preserve your existing workflow.

KEY FEATURES

Automates sensorless aberration measurement & correction
Brings the power of image-based adaptive optics to your fingertips — just a few mouse clicks to optimize image quality during live acquisiton.

Enables plug-and-play adaptive optics
Provides a streamlined path to full AO integration, combining Phaseform's DPP with minimal hardware and software setup, with minimal disruption to your workflow.

Seamlessly integrates with native control software
Runs in the background alongside platforms like µManager & ScanImage, allowing users to operate their microscopes as usual.
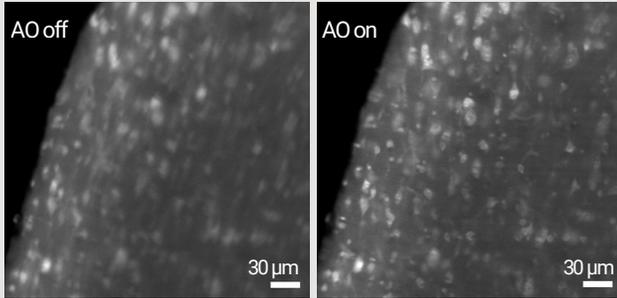
Adapts to diverse modalities and specimen types
Compatible with a wide range of microscopy techniques and biological samples, using a broad selection of implemented image quality metrics to guide optimal correction.
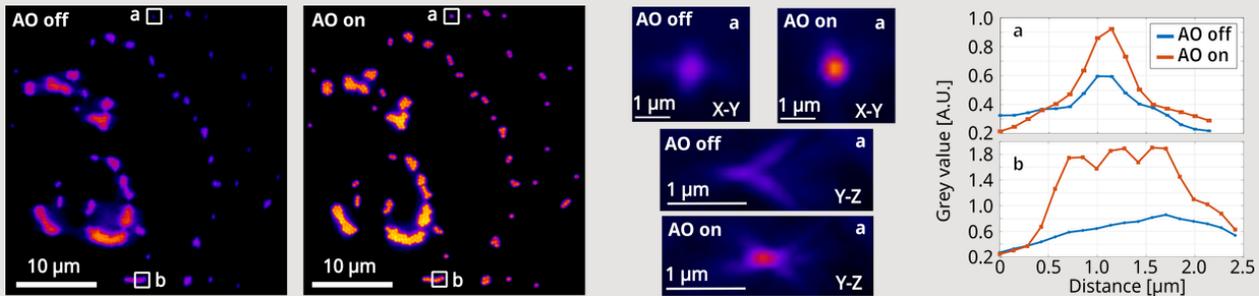

phaseform
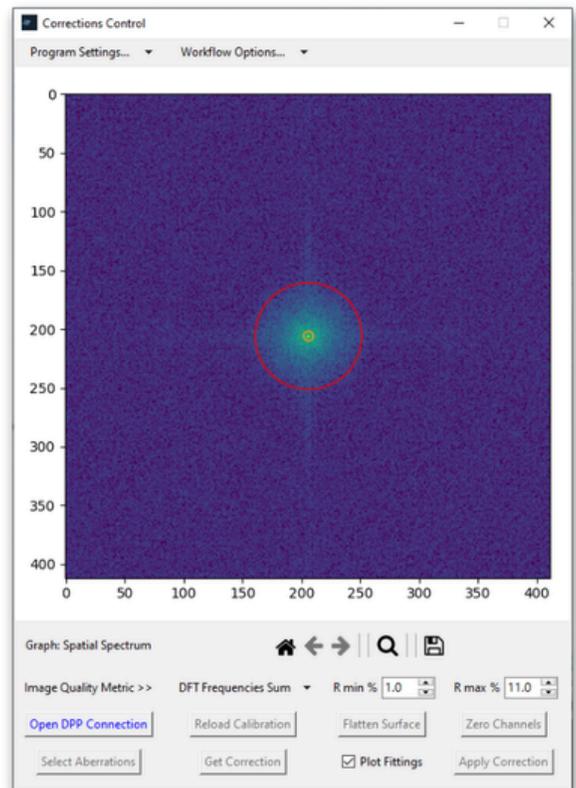
CASE STUDIES

✓ µManager

AO off — 30 µm

AO on — 30 µm

Light-sheet microscope with Delta 7[10] integrated behind a detection objective, enabling imaging >2 mm deep in a cleared pig brain slice.
Center for Brain Research, Medical University of Vienna. Courtesy of Prof. Hans-Ulrich Dodt.

✓ Zeiss ZenBlue*

AO off — a — 10 µm — b

AO on — a — 10 µm — b

AO off — a — 1 µm — X-Y

AO on — a — 1 µm — X-Y

AO off — a — 1 µm — Y-Z

AO on — a — 1 µm — Y-Z

Fluoresbrite® YG microspheres (0.50 µm) imaged with a Zeiss 40×/1.3 NA oil objective under mismatched immersion (n = 1.566 vs. 1.518). Delta 7[10] corrects spherical aberration and higher-order modes up to 4th-order Zernike.
*Zeiss Axiovert 200M, Life Imaging Center, University of Freiburg. Courtesy of Dr. Roland Nitschke.*

✓ ScanImage

AO off — 20 µm

AO on — 20 µm
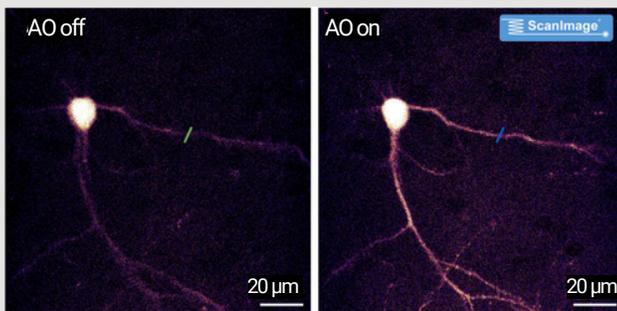
Single neuron imaged 200 µm deep in a *fixed* mouse brain slice using two-photon microscopy with AO correction enabled by a DPP in the illumination path and sensorless correction via Phinden.
*INSS Microscope, DZNE Bonn, Light Microscopy Facility. Courtesy of Dr. Hans-Ulrich Fried.*

✓ Thorlabs ThorImage*

AO off — 100 µm

AO on — 100 µm

AO off — 50 µm

AO on — 50 µm
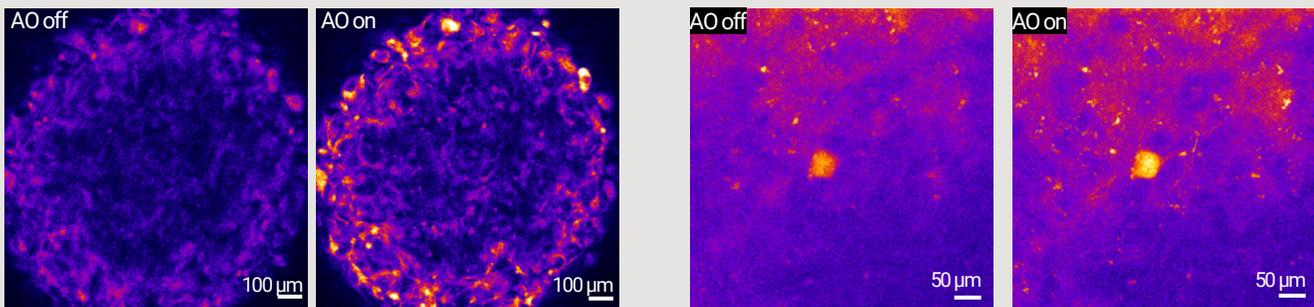
Left: 2-photon deep-tissue imaging in an organic spheroid (Olympus 25×/1.05 W, 920 nm).
Right: 3-photon imaging 320 µm deep in *fixed* mouse brain (32 µm Z-stack projection; Olympus 25×/1.05 W, 1300 nm).
Thorlabs Bergamo, DZNE Bonn, Light Microscopy Facility. Courtesy of Dr. Hans-Ulrich Fried.

☑ **LabVIEW***
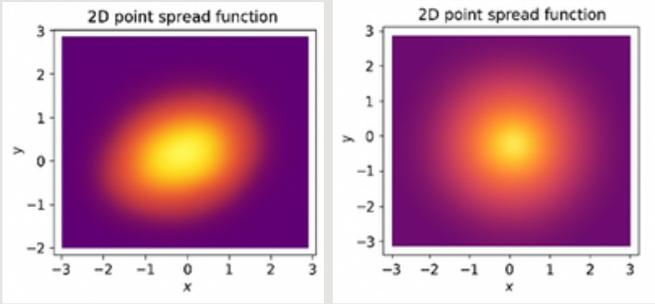
Single-Molecule Localization Microscopy (SMLM) of mobile ATTO488-DOPE in a supported lipid bilayer using TIRF illumination (Zeiss Plan-Apochromat 100×/1.46). AO correction symmetrizes the PSF and improves localization accuracy and effective resolution.
TU Wien. Courtesy of Dr. Mario Brameshuber.

*Requires verification of compatibility using a special script or during a remote session.

SYSTEM REQUIREMENTS

Python	Minimum version 3.8, Maximum version 3.12
μManager	Version: μManager 2.0
ScanImage	MATLAB: version R2020b and higher
	ScanImage: version >= 2019aR0
	Widows: Supported on Windows 7 SP1, 8.1, 10, 11.
ZenBlue	Tested on: ZEN 3.2
ThorImage	Tested on: special version (2025 latest) provided by Thorlabs

YOUR DESIRED CONTROL SOFTWARE NOT LISTED?

Contact us to explore possibilities for integrating PHINDEN with your specific system. We'll make it happen!

DISCLAIMER

All specifications are preliminary and subject to change without notice. No representation or warranty, either expressed or implied, is made as to the reliability, completeness, or accuracy of this specification sheet.

CONTACT US

Get in touch with us today for a live demo!

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