



# WAVE SUITE

Software solution  
**The control package**

WaveView for metrology  
WaveTune for adaptive optics  
WaveKit for custom development +



## OUR METROLOGY SOFTWARE

The user-friendly design makes it possible to get the most out of optical metrology with our HASO wavefront sensors and HASO R-Flex2 metrology systems.

WaveView provides an intuitive software environment with tailored workspaces for specific applications required in production configurations.

Waveview also includes technologies that are integrated to our sensors :

- + **SpotTracker** : a new technology that allows you to use certain HASO wavefront sensors without alignment and access to an absolute measurement of tilts without any ambiguity in a range of 6 degrees.
- + **Lift technology** : The principle is to analyze the centroid intensity distribution created by each microlens and use phase retrieval techniques to reconstruct complex wavefronts at the scale of each microlens.

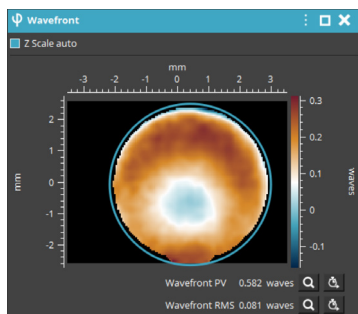
## WITH WAVEVIEW, YOU CAN :

- + Connect to several HASO with one computer
  - + Perform zonal or modal wavefront reconstruction
  - + Compute modal coefficient based on Legendre or Zernike polynomials
  - + Autosave wavefronts or define a script for sequential acquisition to track changes over time
  - + Reconstruct a full-pupil wavefront even with occultations
  - + Easily define a custom pupil with the pupil design tool
  - + Get point spread function (PSF) and 3D MTF of the lens under tests
- Real time measurment, allowing Tracking time evolution of all parameters
- + Get laser characteristics with  $M^2$  option confrome norme ISO 11146



## WAVEFRONT ANALYSIS :

- + **Wavefront reconstruction** in 2D maps or 3D graphs using either Zonal or Modal methods

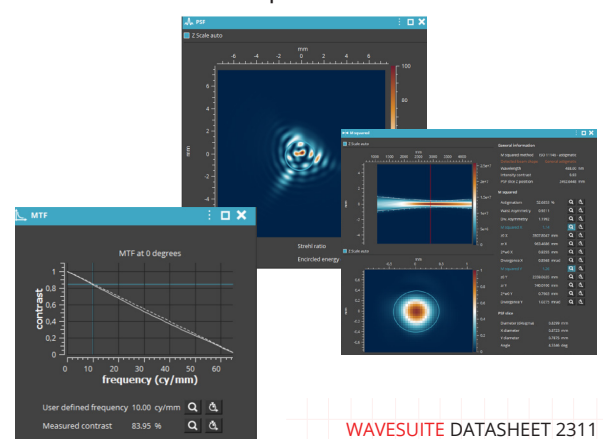


- + **Display coefficients** as bar graphs and arrays representing coefficients values of Zernike or Legendre polynomials

Name	values (μm)	Actions
Z03 Focus	0.0000	
Z04 Astig. 0°	0.0000	
Z05 Astig. 45°	0.0000	
Z06 Coma 0°	0.0029	
Z07 Coma 90°	0.0018	
Z08 Spherical	0.0009	
Z09 Trefoil 0°	-0.0047	
Z10 Trefoil 90°	0.0050	
Z11 5th Astig. 0°	-0.0012	
Z12 5th Astig. 45°	0.0032	

## SOFTWARE OPTIONS :

- + **Point Spread Function (PSF)** : Strehl ratio is displayed along with the spot geometric parameter. This data can be calculated either with second-moment width method or with encircled energy calculation method
- + **Modulation Transfer Function (MTF)** : Representing MTF in 2D maps or 3D graphs and profiles calculated for selected directions
- + **M squared ( $M^2$ )** : Calculating beam quality and Gaussian beam parameters



## OUR ADAPTIVE OPTICS SOFTWARE

WaveTune is an easy-to-use adaptive optics control software with an intuitive user-oriented interface. It is perfectly adapted to HASO sensors as well as to a wide variety of active optics including ILAO Star, Mirao 52e, mu-DM and other Spatial Light Modulators (SLM).

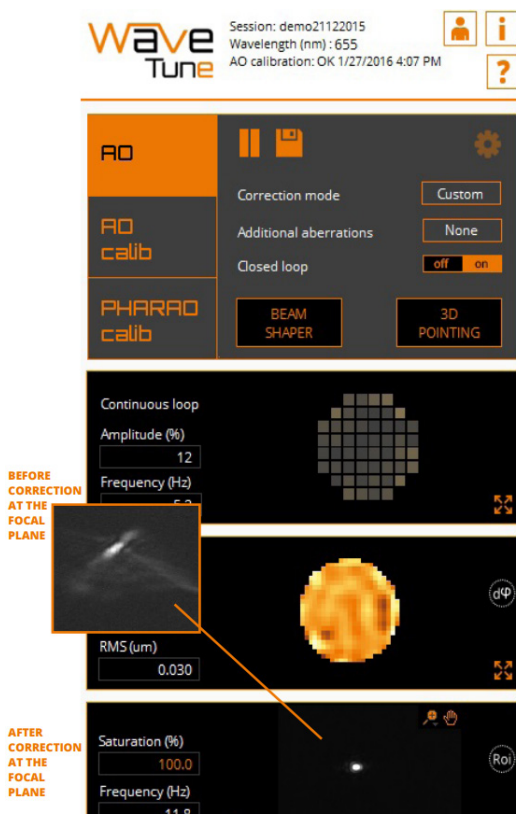
WaveTune controls active optics and HASO wavefront sensor in a feedback loop. It computes commands to be sent to the deformable element according to the measurement supplied by the wavefront analyzer. This software is optimized for high-power laser applications.

## WITH WAVETUNE, YOU CAN :

- + Control HASO and active components based on measurements
- + Measure and analyze influence matrix
- + Correct the wavefront in open-loop or closed-loop process
- + Integrate security check functions with different settings configurations
- + Modify the target wavefront in real-time using zernike polynomials
- + Create sessions to control different optical set-ups with a single software
- + Connect with Waveview to employ its advanced wavefront analysis features
- + Control a full-pupil wavefront even with random obstructions



## WAVEFRONT CORRECTION :



## SOFTWARE OPTION :

- + **Pharao, a "Phase Retrieval" software :** Diagnosis camera for residual aberration correction at the end of the laser chain & focal spot optimization module for WaveTune software



## OUR SOFTWARE DEVELOPMENT KIT

Imagine Optic's Software Development Kit (SDK) provides building blocks so that one can write fully customized software for specific applications using HASO wavefront correction plus active optics including ILAO Star, Mirao 52e, mu-DM & any other SLM.

The WaveKit tool enables integration of Imagine Optic solutions into external end-user applications.

This SDK is addressed to different programming users such as engineers, scientists and researchers and provided with tens of examples

## WITH WAVEKIT, YOU CAN :

- + Integrate Imagine Optic systems as you need for your application using either C/C++, Labview or Python SDK
- + Fully customize your adaptive optics set-up in open- or closed-loop
- + Experience more than several hundreds functions



## 3 EDITIONS AVAILABLE :

### Metrology edition

For optical metrology set-up, includes :

- + HASO wavefront sensor control
- + Wavefront and intensity analysis

### Adaptive Optics edition

For AO set-up, includes :

- + Metrology edition
- + Active optics control
- + Wavefront correction diagnosis
- + Open & closed-loop systems
- + Influence matrix analysis

### Full edition

Includes :

- + Adaptive Optics edition
- + Options for PSF,  $M^2$  & MTF



## CONTACT US

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