

NLOPTICS

HARP SERIES

Non-destructive optical inspection for advanced materials

Semiconductors · Photonics · Functional materials

From POC to the industrial inspection TOOL



HARP SERIES

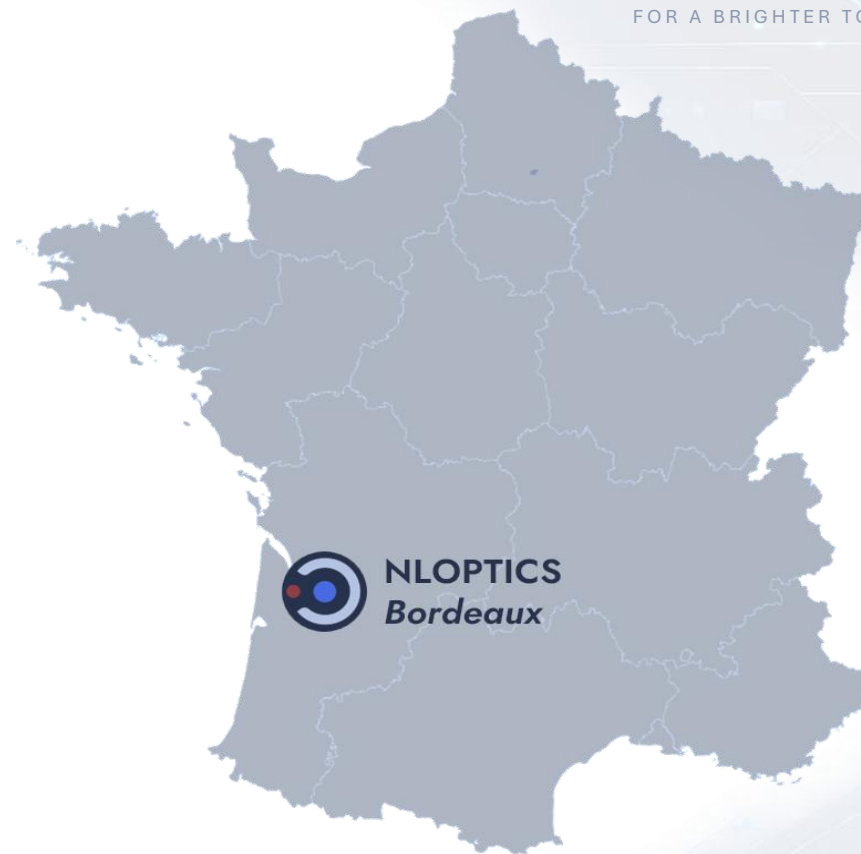
Automated nonlinear inspection

Designed for surfaces, buried interfaces and thin films.

NLOPTICS

Fournisseur de solutions d'inspection pour matériaux avancés

- Non-destructive inspection for advanced materials
- Semiconductors & photonics
- Inspection of surfaces, buried interfaces & thin films



ADVANCED MATERIALS
FOR A BRIGHTER TOMORROW

FROM
BORDEAUX
TO A MORE
INNOVATIVE
WORLD

+16

Industrial collaborations

Semiconductor, photonics and advanced materials

+9

Active projects

POC, application validation and product pathways

+3

Awards and distinctions

DeepTech, innovation and industry

+1

Founding patents

NLOPTICS R-SHG a

HARP SERIES NLOPTICS

Provider of inspection solutions for advanced materials

Industrial-grade nonlinear optical inspection for advanced materials



Wafer mapping

Full wafer mapping
up to 300 mm



Speed

Up to 1000
measurements/minute



Resolution

Typical < 5 μm
spatial resolution



Automation

Automated
measurements



Inspection

Non-destructive



Acquisition

Contactless

Key value

- ✓ Non-destructive inspection
- ✓ High-throughput mapping
- ✓ Direct access to functional properties



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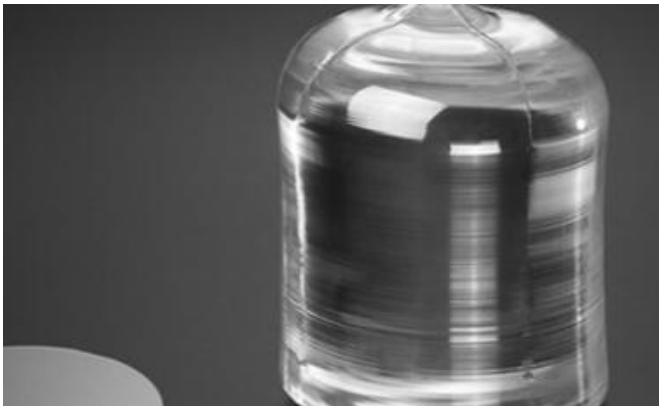
APPLICATION OVERVIEW

Provider of inspection solutions for advanced materials

NLOPTICS R-SHG technology enables monitoring of:

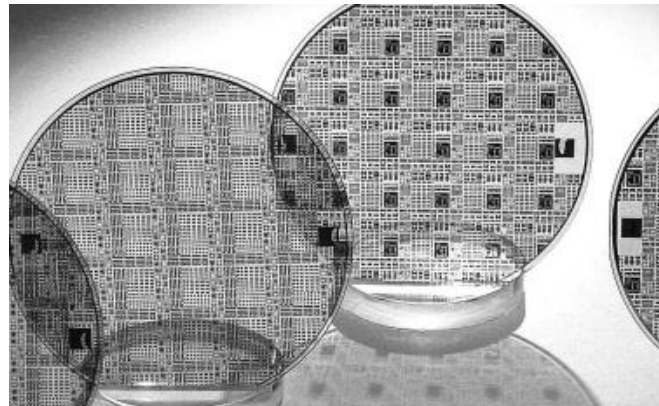
- Residual charges
- Surface doping profile
- Layer non uniformity
- Stoichiometric imbalances
- Structural symmetry information
- Anisotropy / Isotropy, and more...

Dielectrics / ferroelectrics



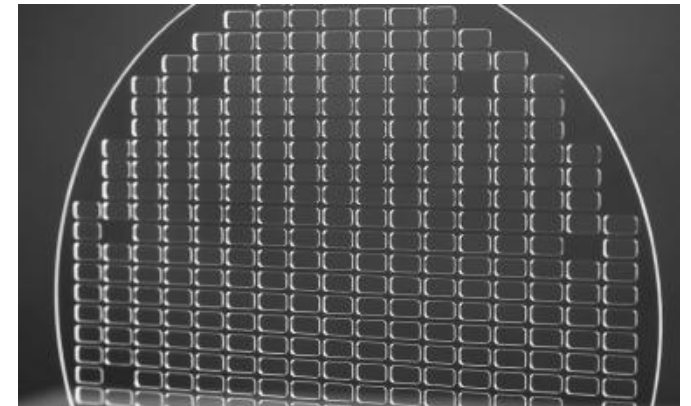
E.g. TFLN, TFLT, BTO, HfO_2

Wafers



E.g. Al_2O_3 , GaN, AlN

Amorphous materials and more...



E.g. Glass substrates

TECHNOLOGY POSITIONING

Provider of inspection solutions for advanced materials

NLOPTICS complements existing methods with an R-SHG measurement designed for qualification and control in production environments.

Technology	Key information	Non-destructive	Contactless	Compatible HVM	Main limitation
SIMS	Doping concentration	✗	✗	✗	Destructive, slow, costly
Raman	Crystal quality / stress / strain	✓	✓	!	Weak signal, long mapping time
SEM / PFM	Surface morphology / topography / roughness	±	±	±	Slow, can be destructive, no crystal information
XRD	Crystal structure / orientation / strain	✓	✓	!	Averaged signal, limited resolution
R-SHG NLOPTICS	Crystal symmetry / functional properties / defects / dopant-related contrast / residual charges	✓	✓	✓ HVM	To be calibrated by use case

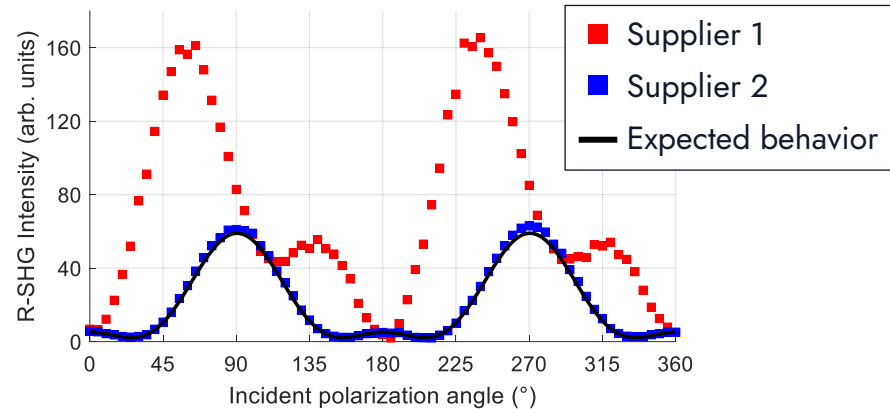
NLOPTICS for AR/VR applications

A quality control solution for every aspect of AR/VR products

Substrates | Passive components

Ex : Glass or SiC substrates structural defects detection

Assessment of the isotropic character of glasses

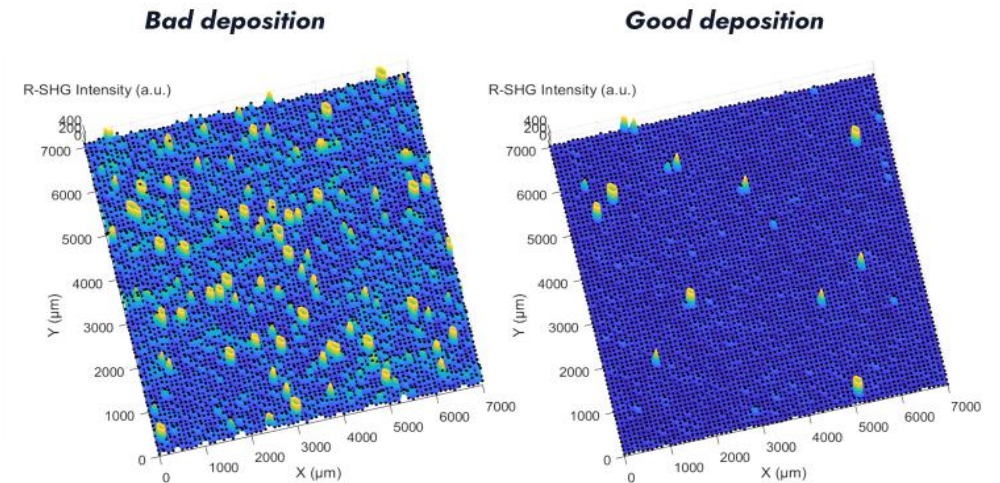


OUTPUT

- Hidden glass substrates anisotropy
- Local structure analysis (stress points, lattice defects, polytypes, etching inconsistencies ...).

Micro Display | Active components

Ex : TFLN Sputtering quality control for AR/VR components



OUTPUT

- Process uniformity validation via nonlinear response mapping
- Cost reduction via new process introduction (CVD vs SmartCut)

SCOPE OF COLLABORATION

Turning unexplained process and materials variations into new insights.

What we are looking for

"Something changed. We don't know why."

- **Unexplained process variations** : Something changed during fabrication, but the root cause remains unclear.
- **Unexpected material differences** : Substrates, batches or suppliers deliver different results.
- **Hidden structural changes** : Conventional metrology cannot fully explain all material behaviors.

We are looking across the AR/VR value chain

- **Material & substrate suppliers** : Developing or qualifying glass, SiC, TFLN and other advanced materials.
- **Component manufacturers & R&D teams** : Exploring and improving new processes, and investigating defects.
- **Device manufacturers & integrators** : Facing challenges with material quality, yield, performance or reliability.

Bring us your challenging samples. Let's explore what R-SHG can reveal.



READY TO COLLABORATE?

From POC to HARP Series deployment:
let's discuss your materials, defects and production objectives.



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SCAN TO VISIT
nloptics.fr



NLOPTICS IN BRIEF

Provider of inspection solutions for advanced materials

NLOPTICS develops the HARP Series to help manufacturers inspect complex materials quickly and non-destructively.

PRODUCT

HARP Series
Non-destructive optical inspection platform

OFFERING

POC → Calibration → Tool
Commercial pathway focused on line deployment

DIFFERENTIATION

Patented R-SHG
Wafer mapping, contactless, HVM-compatible

Target customers

Semiconductor & photonics value chain



Advanced wafer & substrate suppliers

Substrates, thin films, functional materials

Foundries & component manufacturers

Pilot lines, pre-production, FAB / HVM

Integrated photonics players

Photonic circuits, optics, integrated platforms

Equipment makers & technology centers

Metrology, process qualification, co-development



HARP SERIES

Automated nonlinear inspection

Designed for surfaces, buried interfaces and thin films.

+15

industrial collaborations

+3

ongoing projects

1

founding patent

300

mm wafer mapping