

Specifications

- Dimensions : length 276 mm, diameter 86 mm
- Photorefractive crystals : sillenites (BGO, BSO)
- Field of view and observation distance (indicative values):
 - 2 m² at a 2 meter distance from optical head
 - 1 cm² at a 0.1 meter distance from optical head
- Response time can be adjusted (in function of perturbations level). Typical workable value is 5 to 10 s with a laser power of 500 mW and 0.25 m² of observed surface
- Usable lasers :
 - continuous green laser i.e. Argon (514 nm), YAG (532 nm)
 - small tested part (1cm²) : 20 mW laser
 - large tested part (2 m²) : 5 W laser
- Measurement accuracy : 10 nm
- Lateral resolution : 764 X 494 pixels (adaptable)
- Software : basic functional software with open architecture for customer adaptation
- Hardware : portable computer is supplied
- Post-processing : quantification of displacements
- Lens : 50 mm, 1/1.2 (customizable)
- Light transportation from laser to camera : optical fiber
- Semi-automatic pilot system

Options

- Laser : 100 mW – 5 W (single mode)
- Customized lens
- In-plane, out-of-plane configurations (2 D)
- Our product can be adapted to your need in term of mechanical interface, field-of-view, test type, software, hardware,...
- We can lead some necessary studies to achieve your specifications
- We can lead your test on our own rig test based on your specifications.

Targeted industries and laboratories

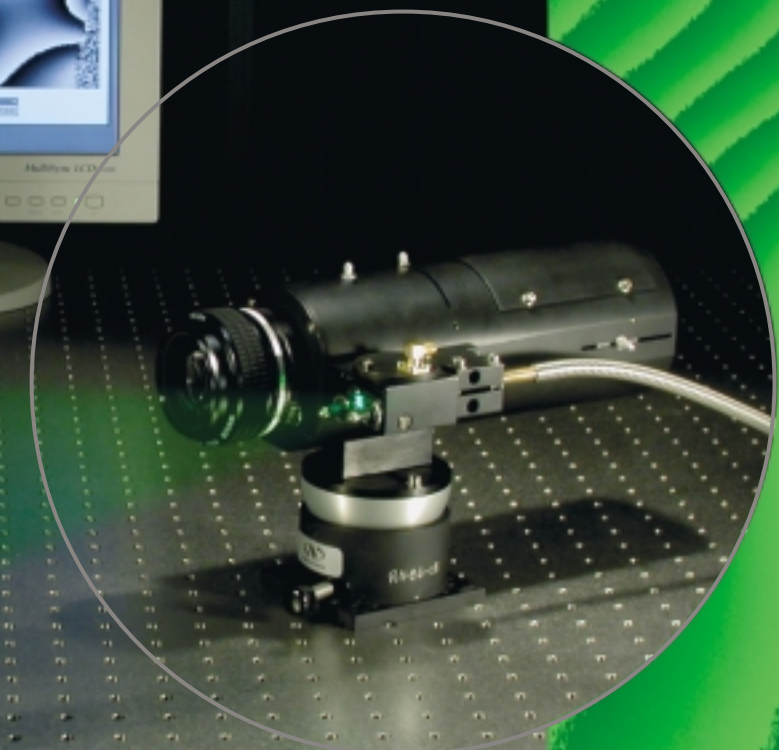
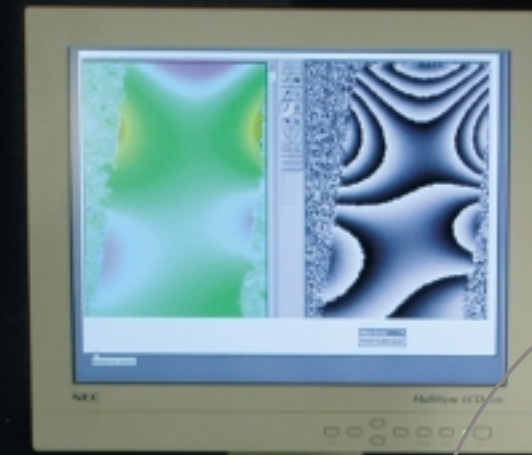
- Aeronautics
- Space
- Transports : cars, rail, metro, ships,...
- Electronics : chips, MEMS,...
- Laboratories, research centers,...
- Composite transformation (sports goods,...).



FROM SPACE TO EARTH HIGH RESOLUTION CAMERA FOR METROLOGY AND TESTING

A novel concept of holographic camera for an user-friendly micro-displacements measurement :

non destructive testing
metrology
dynamic analysis



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Holographic interferometry

Holographic Interferometry is a powerful whole-field optical method allowing object surface displacement measurement in the micrometric to sub-micrometric ranges. Holographic Interferometry consists in producing the interference between two wavefronts, at least one of which is recorded as a hologram in photosensitive materials.

The recording step requires the superimposition of the object beam having traveled via the observed object and a coherent reference beam taken from the same light source. At the readout step, the hologram is illuminated by the same reference beam that has served for the recording.

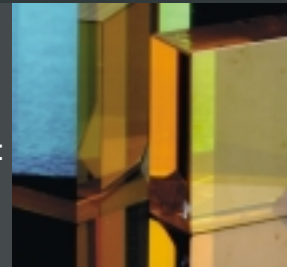
Holography is being used in a growing number of applications. Progress in these areas has been partially stimulated by improvements in the technology for making holograms, with advances in both recording materials and the laser used to record holograms.

ICMCB / CNRS (Bordeaux)

Compact and portable holographic camera

This holographic camera is based on a photorefractive crystal:

- true holographic recording = high resolution
- self-developing = user-friendly
- reusable = user-friendly



The research efforts allowed to miniaturize the whole set-up into a compact portable optical head (with an optical fiber for light transportation from the laser source) that is extremely simple to use.

The camera head dimensions are now comparable to that of conventional video camera.

With such a concept, the holographic camera can be easily adapted to complicated measurement geometries.

Product advantages

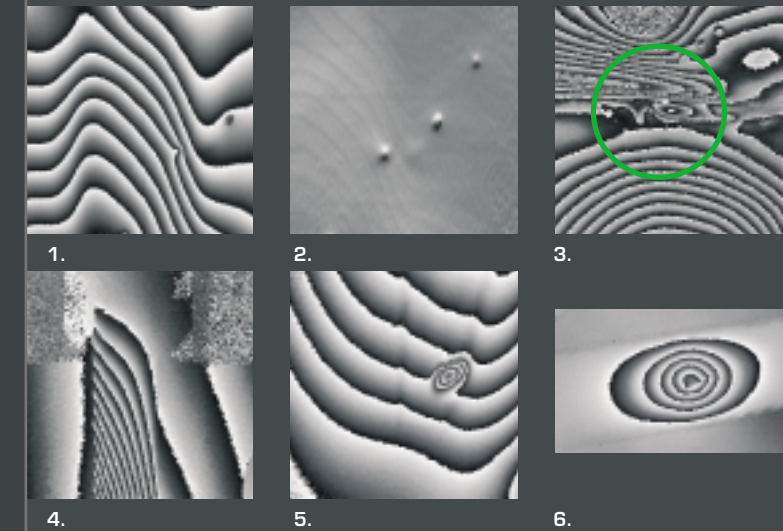
- > Very compact system: portable optical head (length: 28 cm)
- > User-friendly handling requiring a very short period of training (2 days)
- > High level of lateral and depth resolution (up to 10 nm)
- > Real-time technology allowing a direct control of operations in progress
- > Quick measurements and data processing, especially thanks to the use of the photorefractive crystal
- > Exceptional great versatility of use with the same equipment: size of the tested object, type of test,...
- > Possibility of customizing: laser power, optical lens, drivers,...
- > Absolutely no contact with the tested object
- > Recording system: indefinitely reusable crystal (no cost)
- > Attractive price.

Applications

→ Holographic non destructive testing :

- Delaminations
- Welding defects
- Bonding defects
- Impact damages
- Cracks
- ...

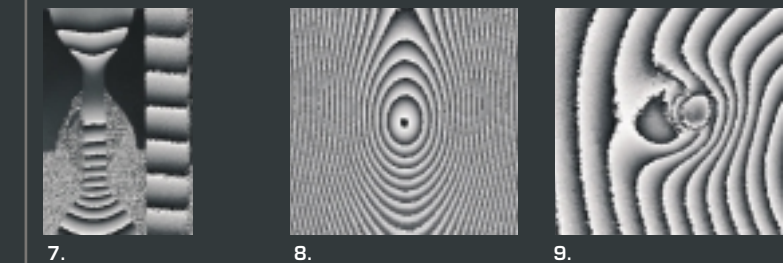
1. Delamination in a composite material plate
2. Numerical focus on the defects
3. Internal defects in a composite material structure
4. Cracks detection
5. Bonding defect in fibre carbon structure (CFRP)
6. Welding defect



→ Micro-displacements metrology :

- Thermo-mechanical behaviors
- CTE measurements
- Finite element model correlations
- ...

7. In-plane and out-of-plane deformation
Full field strain analysis
8. Calibration of piezo sheets bonded under plate
9. Thermo mechanical analysis of insert in honeycomb



→ Vibration mode shapes measurements

- Full field vibration measurements:
10. Aircraft engine blade
 11. Aircraft engine vane
 12. Aluminium plate.

